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Inopportune Pay Demand

THE National Union of Railwaymen has allowed impatience to prevail and has demanded substantial increases for its members employed by British Railways, London Transport, and other undertakings of the British Transport Commission. The claim on behalf of British Railways staff, affecting by far the greatest number of N.U.R. members, and the first to be considered, was discussed last Wednesday at a meeting of the Railway Joint Staff Council, when the Commission representatives undertook to consider the matter. This is the first stage in the machinery of negotiation. The basis of the N.U.R. claim is partly the loss in railwaymen's earnings resulting from reduced overtime and Sunday pay. Because of rationalisation in operating methods, with consequent staff economies, the situation in this respect has changed considerably since the last pay increase, of 3 per cent, from June 30, 1958. The rise in the cost of living since that date has not been great enough to call for a "substantial" increase in basic pay, however objectionable such an increase might be on other grounds. The agreement on wages last summer provided for a review of railway pay by an independent committee which should compare the pay of railway salaried and conciliation staff

with the pay of the employees in other nationalised industries, public services, and comparable private undertakings. That committee, under the chairmanship of Mr. C. W. Guillebaud, is still conducting its investigations, which must take time. It is unfortunate that the N.U.R. executive has let itself be forced by its branches, which tend to be dominated by hotheads because of the apathy of the more level-headed railwaymen, to make a demand which is most inopportune. The factors affecting overtime and similar payments, on which the N.U.R. demand is largely based, are amongst those being inquired into by the Guillebaud committee. Anything less than a comprehensive and unhurried examination by that body can lead only to valueless conclusions. The union is not prepared to wait for the committee's report. Pending its publication, it is hard to see what the Commission can be expected to concede as regards overtime and similar payments, or indeed in any increase in basic rates. The other two railway unions, the Associated Society of Locomotive Engineers & Firemen and the Transport Salaried Staffs' Association, are prepared to wait. Apart from this, with a deficit for 1958 and another already expected for the current year, and railway freight traffic, which furnishes half the revenue from carrying activities of the nationalised transport undertaking, at a low level, the Commission is in no state to add to its outgoings on wages.

K. J. Cook

THE ability of Mr. K. J. Cook, retiring Chief Mechanical & Electrical Engineer, Eastern and North Eastern Regions, British Railways, was shown as early as 1921, when, despite war-time interruption of his premium apprenticeship at Swindon, he gained the G.W.R. Chairman's Prize. From then on his responsibilities at Swindon rapidly increased, until, as Locomotive Works Manager, he undertook, throughout the 1939-45 war, the organisation and large-scale production of war stores, in addition to routine work. His presidential address to the Institution of Locomotive Engineers, in 1955, "The Steam Locomotive—A Machine of Precision," typifies in its title the character of Mr. Cook. In locomotive construction, as in everything else, he believes that a high degree of accuracy is essential to economical operation. Although a steam locomotive engineer by early training and experience, he realised the importance of other means of traction. Since his move, in 1951, to the Eastern and North Eastern Region, as Chief Mechanical & Electrical Engineer, he has been active in the introduction of both diesel and electric traction on those regions. A biography of Mr. Cook appears elsewhere in this issue.

Chittaranjan Builds Tank Engines

THE building of broad-gauge tank locomotives, which has begun at the Indian Railways Chittaranjan Locomotive Works, after concentration on broad-gauge goods locomotives, is intended to answer a need for motive power for heavy suburban traffic. The engines are understood to resemble the "WM" class 2-6-4T supplied a few years ago by Vulcan and Robert Stephenson. These have 5 ft. 7 in. coupled wheels and a tractive effort at 85 per cent boiler pressure of 19,000 lb. The duties of the new tank engines include haulage of 10-coach suburban trains at up to 60 m.p.h. The only suburban lines in India not already electrified, where such performance is required, seem to be the South Eastern (former Bengal Nagpur) and Eastern (former Eastern Bengal) Railways around Calcutta, and the Southern (former Madras & Southern Mahratta) Railway lines round Madras. All these are being electrified, or are under consideration for electrification. Use could also be found for powerful 5 ft. 6 in. gauge passenger tanks on less intensive services around Delhi, Agra, Cawnpore, and Lucknow, and perhaps Hyderabad.

Indian Diesel Motive Power Policy

THE placing in service on the Northern and Southern Railways of India during the past year of broad-gauge diesel-mechanical railcars built by the Commonwealth Engineering Co. Ltd., of Sydney, indicates a renewal of active

interest in this form of transport in the Republic of India. The diesel motive power supplied to the Indian railways in recent years has consisted mainly of main-line and shunting locomotives. The former are used on goods trains, to answer an urgent need for motive power created by the growth of freight traffic, or on passenger trains, as required. The intention is that some of these machines, when displaced eventually by electric traction on the heavily trafficked sections over which they now work, shall in turn take over from steam on other lines. The Deputy Minister of Railways, Mr. Shah Nawaz Khan, stated recently that development of indigenous construction of diesel railcars was under consideration. With manufacture of steam locomotives at Chittaranjan, which has been proceeding for some years, the manufacture of a.c. multiple-unit electric stock and locomotives and the plans for constructing diesel locomotives, this is a further development in the plans for achieving self-sufficiency in motive power. The manufacture of diesel railcars in India, like that of electric locomotives, raises difficult problems of technical skill of works staffs.

Overseas Railway Traffics

EAST African Railways & Harbours total earnings in the month of March 1959, were £2,030,000, some £62,000 below the level estimated for the month. Railway earnings were £63,000 below and harbour earnings £1,000 above the estimated figures for March. Total earnings for the first three months of 1959 were £6,311,000 as against £6,102,000 in the same period last year. The earnings for the first three months were £91,000 above the estimates for that period, and because of savings in expenditure, net earnings were as much as £298,000 above the amount estimated for the three months. The approximate railway revenue for March amounted to £1,634,000 compared with £1,600,000 in March, 1958, an increase of £34,000. Earnings from goods and livestock services were £1,302,000 and £25,000; £40,000 and £7,000, respectively, greater than the March, 1958 figures. These increases were partly offset by decreased passenger earnings, which, at £133,000, were £10,000 less than in the same period last year. Costa Rica Railway receipts for March amounted to colonies 2,426,640 compared with colonies 2,188,203 in March, 1958, an increase of colonies 238,437.

Opening Up the Western Sudan

COMPLETION to Nyala of the Sudan Railways 3-ft. 6-in. gauge, 90-mile extension from Ed Da'ein, which was opened last week by President Abboud, provides a rail link between Darfur, westernmost province of the Sudan, with the rest of the Republic. The southern portion of the Darfur is cattle-raising country, and the new railway will facilitate exports of meat to other parts of the Middle East. Livestock hitherto has been moved on the hoof to El Obeid and other railheads, or even direct to the Egyptian frontier. Nyala is the terminus of the projected line from the Sudan to Nigeria, which is planned to convey, amongst other traffic, Nigerian pilgrims to and from Mecca. The next extension of the Sudan Railways is from Babanusa, on the line from Khartoum to Ed Da'ein, to Wau, some 280 miles, to be completed in 1961. For this programme of new construction and for procurement of motive power and rolling stock a loan of £14 million has been made by the World Bank.

Mokameh Ganges Bridge Opened

OPENING last Friday by Mr. Jawaharlal Nehru, Prime Minister of India, of the 6,000-ft. long rail-and-road bridge over the Ganges at Mokameh, in Bihar, strengthens an important link between the metre and broad (5-ft. 6-in.) gauge systems on the left (north) and right shores respectively. One of the few connections between the systems has been the wagon ferry at Mokameh. This conveys metre-gauge wagons, and transhipment to and from broad gauge has taken place on the right bank. The new bridge bears a broad-gauge track and a roadway, and new transhipment yards have been built on the left bank. The need for a bridge has long been recognised but construction, after examination on several occasions by the Railway Board, was considered financially unjustifiable. As a result of the war of 1939-45, the trend and volume of

goods traffic over the Ganges changed considerably, and the building since Partition of the Assam Link line, which avoids Pakistan territory, necessitated improved rail connections between Calcutta and South Bihar south of the river, with North Bengal and Assam on the other side. The main features of the bridge were summarised in our January 17, 1958, issue. Frequent reference to progress in construction has been made in these pages from time to time.

Pride in Names and Traditions

AT the Royal Albert Bridge centenary celebrations last week-end several speakers referred with regret to the disappearance of the name "Great Western Railway" since nationalisation. The Chairman of the Western Area Board, Mr. R. F. Hanks, at the dinner given by the Lord Mayor of Plymouth, said he did not accept the criticism that pride of the G.W.R. had disappeared with its name. It was a very proud region and the spirit that had animated Brunel and other forebears of the present officers and men was still fully alive. It was the spirit and not the name that counted. He illustrated his point by referring to Mr. K. W. C. Grand, until recently General Manager and now a Member of the British Transport Commission. The Commission was very glad to have among its members so able and experienced a railwayman as Mr. Grand with all his independence of outlook and often of action. The present General Manager, Mr. J. R. Hammond, was an engineer whose training had been with Sir Allan Quartermaine, former Chief Civil Engineer, and with Mr. M. G. R. Smith, the present Chief Civil Engineer, both worthy successors of Brunel. He had no fears that the Western Region would not accept the challenge of the present and whatever the future might bring, and would live up fully to the high traditions it had inherited.

Improving Services in the Birmingham Area

FACTS as to what has been and is being done by British Railways to improve services were well presented last Friday by Sir Brian Robertson, Chairman of the British Transport Commission at the annual banquet of the Birmingham Chamber of Commerce. A summary of his remarks is given elsewhere in this issue. As a result of introducing diesel railcars in the London Midland Region suburban services in the Birmingham area, he pointed out, the number of passengers by these services increased by over 31,000 last January, compared with the same month in 1958. On the Birmingham-Lichfield line journeys have increased from 32,000 a month, with steam working, to more than 95,000. Patronage of the inter-city diesel trains between Birmingham and South Wales has been well maintained. As to goods traffic, he drew attention to the re-building and re-equipping of Birmingham Lawley Street goods depot, to be completed by the end of this year. As to the future he reminded his audience of the developments which will go far to improve railway service in the Birmingham area, such as the high-speed Pullman diesel trains being built by the Metropolitan-Cammell Carriage & Wagon Co. Ltd. at Saltley, near Birmingham, to run between Wolverhampton, Birmingham and Paddington; electrification of the main Euston to Manchester and Liverpool main lines, and Birmingham suburban lines of the L.M.R.; and reconstruction of New Street Station, which is to be carried out in conjunction with re-development of the central area of the city.

New Telephone Exchange at York

WITH the inauguration of the new telephone exchange at British Railways, North Eastern Region, headquarters offices at York, described elsewhere in this issue, British Railways has pioneered the first private subscriber trunk dialling network in the United Kingdom. Operating initially in the North Eastern Region, it will ultimately include "on demand" trunk dialling to King's Cross, Edinburgh, Manchester, and other major railway centres. The new equipment replaces a 310-line exchange installed 25 years ago. From 1934 to 1959 the old exchange was increased and greater demands placed upon it, until a saturation point, reached about 1950, caused serious congestion within the exchange.

This congestion led to difficulties being experienced by both internal and trunk subscribers. The general overloading also led to a number of subsidiary switchboards being installed in various departments throughout the York District. The position is now relieved and all the subsidiary switchboards have been recovered. Great savings will be achieved in time and manpower from the new exchange, and the equipment has been designed to cater for future expansion and developments in the British Railways telecommunications modernisation programme.

Traction Motor Repairs in Brazil

DESPITE the great distance from the country of origin, repaired and overhauled traction motors leaving the Belo Horizonte factory of Metrovick do Brasil (Eletricidade) Ltda. are covered by guarantees equivalent to those applying to the equipment when originally built in Great Britain. The necessary standard of work is achieved by special training of Brazilian labour for technical work, strict quality control of the materials used, and by testing each rebuilt motor to ensure that in every way it is capable of giving the required performance. The factory, which is described elsewhere in this issue, was established by the Brazilian subsidiary of Metropolitan Vickers Electrical Export Co. Ltd., to maintain the traction equipment supplied to Brazil by that company with a large number of motor coaches and electric locomotives. It was the first works in South America specifically designed and equipped for dealing with railway traction electric motors. There are facilities for complete electrical overhauls on locomotives. Several items of specialised plant and equipment were designed and built by the parent company at Sheffield.

"Trans-Alpin Express"

WITH a year's daily working behind it, the "Trans-Alpin Express" between Vienna and Zurich is now an established feature of passenger traffic operation on the Austrian Federal Railways, over which system it runs for 88 per cent of its journey. The timings of this train, at 11 hr. 38 min. westbound and 11 hr. 35 min. eastbound for the 532 miles, including stops at Linz, Salzburg, Schwarzach St. Veit, Innsbruck, Feldkirch, Buchs, and Sargans, are 107 and 125 min. quicker than the Arlberg-Orient Express with 16 intermediate stops. Top speed is limited to 80 m.p.h. In neither direction does the train run into Salzburg Hauptbahnhof, which would mean reversal, but stops at Salzburg Aigen, from and to which there is a special connecting bus serving the town centre. It is understood that, beginning with the summer timetables, the "Trans-Alpin" will be extended to Basle, and, with a change there, will provide a good connection to Paris. Four four-car trains were completed last year by Simmering-Graz-Pauker's Graz works for the "Trans-Alpin," but now they not only cater for that service but also for another international daily service from Villach to Munich via the Tauern Tunnel and Salzburg.

Long May They Stay

FOR some months the hearts of all true railwaymen north-bound from Euston have been quickened by the sight of old engines in a siding on the up side of the line at Bagnall Wharf, a few miles south of Crewe. They are a Midland compound 4-4-0, two L. & Y. 2-4-2T engines, an L. & Y. 0-6-0, and one of the same railway's 0-6-0 saddle tanks, and an L.T.S. 4-4-2T, all rusting away, but perhaps because of that more real than the beautifully polished engines in York Museum. Three can fairly be claimed to have been express, the Midland compound obviously, but the "Lanky" and Tilbury tanks because of their large share in express working early in this century between Manchester and Blackpool, and between Southend and Fenchurch Street. Some of the L.Y.R. were among the first English tank engines to be superheated; the Tilbury 4-4-2 tanks were the first to receive the elder Whitelegg's variable-blast pipe, about 1909. An L.Y.R. 2-4-2T was the first engine to be completed at Horwich works, in 1889; by 1910 there were 270 of them running nearly 8,000,000 miles a year. The long residence of these engines at Bagnall Wharf shows there is no great urgency for scrap or for the money from it; so "long may they stay."

Eastern Region Summer Timetables

ONE of the most substantial improvements to be introduced with the Eastern Region summer train service is in the suburban area of the Great Northern Line, partly as the result of the opening of the widening from Greenwood to Potters Bar, and partly due to faster point-to-point times. Additions will be made to the service, in particular at the peak hours, and in certain cases these will permit the excision of stops from some of the trains running over the longer distances, so enabling ever greater cuts to be made in the times to and from the outer suburban area.

Between Kings Cross and Hitchin, for example, accelerations of up to 10 min. are common; Finsbury Park will be missed by more trains, permitting non-stop runs by some trains out to Potters Bar in 20 min., faster than ever previously. Similarly on the Enfield and Hertford line there will be a general acceleration of 6 to 7 min. between Kings Cross and Enfield Chase and 7 to 9 min. between Kings Cross and Hertford North; also the number of trains not stopping between Finsbury Park and Palmers Green will be added to; other trains will miss out Winchmore Hill and Grange Park. The evening service from Broad Street to Great Northern Line stations will be increased from 10 to 14 trains, some no longer calling at Dalston Junction. All the Kings Cross and Cambridge buffet trains will call additionally at Stevenage, and also, in the case of trains not already stopping there, at Royston. The services to and from both these stations will be further improved by new buffet trains from Kings Cross to Royston at 11.12 a.m. and 5.26 p.m., returning at 1.34 and 8.4 p.m., stopping also at Welwyn Garden City and Hitchin. Cambridge will suffer, however, by these changes, as the 9.7 a.m. from Kings Cross (now 9.25) will take 94 instead of 84 min.; the 1.25 p.m. (now 12.25 p.m.) 87 instead of 85 min.; the 3.16 p.m. (now 2.16 p.m.) 87 instead of 80 min. There will be worse decelerations in the up direction, in the case both of the 11.15 a.m. and 3.15 p.m. by no less than 14 min. to 94 and 95 min. respectively. The 6.15 p.m. up will start 20 min. earlier. Before the last war the Cambridge buffet trains took 77 min. down and 72 min. up, and this is a service badly in need of acceleration rather than slowing.

On the Great Northern main line the only stations which will remain open between Huntingdon and Doncaster will be Peterborough, Grantham, Newark, and Retford. The summer service of expresses will be almost identical with that of 1958, save that the 6.20 p.m. from Kings Cross to Leeds will start 8 min. earlier, and the 6.35 p.m. to Hull 9 min. earlier, in order to leave a better margin ahead of the 7.20 p.m. "Master Cutler," which has suffered delay at times from both these trains. The up "Master Cutler" will run on Saturdays, as well as on other weekdays, at its normal times, but will return from Kings Cross at 3.10 p.m. on a much slower schedule of 3 hr. 25 min. to Sheffield, Saturday congestion preventing a faster timing.

On the Great Eastern Line the daily "Easterling" will not run this summer from Liverpool Street to Yarmouth and Lowestoft, but this 11.3 a.m. path in the down direction will be occupied by a non-stop train to Clacton-on-Sea, due at 12.36 p.m. Throughout the week, the customary hourly "Clacton Interval Service" will be provided daily from London, at 33 min. past the hour from 8.33 a.m. to 3.33 p.m., followed by the usual commuter expresses at 4.36, 4.58, 5.27 and 5.40 p.m., and then resumed from 6.33 to 9.33 p.m., but on "Britannia" timings, from 10 to 20 min. faster than those of last summer. The corresponding up expresses will leave Clacton for London at the even hours from 9 a.m. to 9 p.m., with certain minor variations in departure times. The down "Hook Continental" will be accelerated to reach Parkeston Quay in 87 min., 2 min. less than in 1939. On Saturdays the four fastest expresses between Liverpool Street and Norwich in each direction will work to their normal 2 hr. schedules, and the intermediate expresses to their 2½-hr. schedules, despite the dense occupation of the Colchester main line. After early morning expresses at 7.47, 7.50, and 9 a.m., an hourly service will run from Liverpool Street to Lowestoft and Yarmouth at the standard 38 min. past the hour intervals, from 9.38 to 3.38 p.m. (except 2.38), and with additional trains at 9.58, 11 a.m., 12.7, 12.47, and 3 p.m. All these trains will run to Yarmouth via Lowestoft, reversing there and calling at Gorleston, and all but the 12.7 and 3 p.m. with refreshment facilities. No down Saturday train will fail to call at Ipswich,

but an interesting innovation will be a 10.20 a.m. from Liverpool Street to Cromer and Sheringham avoiding Norwich by the Wensum curve. Another densely occupied main line on Saturdays will be that between Ely and Norwich, which will carry many of the trains from the Midlands and the North to Lowestoft, Yarmouth and Cromer that formerly travelled by the Midland & Great Northern Joint Line.

Many changes are made in the format of the timetable book. The Colchester main line table shows the service from Ipswich to Yarmouth via Lowestoft, with the direct but less-used Beccles-Yarmouth service via Haddiscoe in a separate table. The Cambridge main line table is now from Liverpool Street to King's Lynn, with the Ely-Norwich service in a separate table. The closing of Great Northern main line stations has made room for the inclusion of the full Doncaster-Wakefield-Leeds service in the King's Cross to York table. The Manchester-Sheffield-Grimsby-Cleethorpes table is greatly simplified by transfer of the Penistone-Doncaster-Scunthorpe-Grimsby and Sheffield-Doncaster-Hull services to separate tables.

Services now omitted from the Eastern Region book are Marylebone-Nottingham (the former Great Central main line), York-Newcastle, Manchester-Hadfield, Manchester-Liverpool, Leeds-Bradford and Leeds-Pontefract; additions are Derby-Chesterfield-Sheffield-Cudworth, Chesterfield-Nottingham by the former Midland route, Sheffield-Barnsley-Leeds, and Sheffield-Chinley. While these modifications arise from changes in Regional boundaries, some of them are unhelpful, as, for example, the inclusion of portions of main-line services which, although within E.R. territory, have no connection with Eastern Region services proper, and are cut short at such unimportant places as Cudworth or Chinley. It is good to see that, in line with North Eastern and Scottish Regional practice, the Eastern Region now clearly indicates all regular diesel train workings as such. It might be well in future to indicate electric services in the same way. Other changes are in the quality of the printing, which is greatly improved.

The Signalling Industry and the Railways

AMONG the results of the coming of the railway was the creation of several new branches of industry to provide the specialised equipment needed, including telegraphic apparatus and eventually signalling equipment, simple forms of which were being produced by the once well-known firm of Stevens in the 1840s. The demand for more elaborate appliances made itself felt before long and other undertakings, such as those of Saxby & Farmer and McKenzie & Holland, with inventors like Tyer and Sykes devoting their attention to electrical equipment, were established and were soon producing much material for the growing railway system.

The relations between these concerns and their clients became very close. Much installation work was carried out by the firms, and maintenance also often was entrusted to them. In this way began that co-operation which has had such beneficial results in many directions to which Mr. D. G. Shipp, of the Westinghouse Brake & Signal Co. Ltd., and new President of the Institution of Railway Signal Engineers, alluded in his recent inaugural address. He emphasised the depth of experience acquired by the members of the signalling industry over the years, and the variety of ways in which it had been directed to raising the efficiency of railway operation. A glance over the patent records shows also how much thought was bestowed on signalling problems by those directing the various undertakings and how many and well-designed were the devices by which the principles of interlocking and space interval working came to be made effective.

It was natural that these developments should be particularly adapted to the conditions obtaining in the United Kingdom and that there should be little inducement to look elsewhere. With the introduction of the air brake to this country there became established that close association between the signal industry here and those engineers in North America who were faced with very different operating requirements and were developing automatic signals controlled by track circuiting and various forms of power signalbox. Of these the types using compressed air, with or without electrical control, were installed in Britain through this collaboration—as was the track circuiting on the electrified London Underground lines,

in improving which British engineers played a great part, especially in the application of alternating current. Continental influence, however, was noticeable in the first of the more complete purely electric installations.

What had been accomplished in America became skilfully adapted to British conditions and, aided by much able independent research, offered railway managements the means of improving train operation with an appreciable increase in the safety factor, as exemplified at certain termini and various electrified routes, such as those to the south of London. The two world wars did not help to accelerate the process from the immediately practical point of view. Their effects on the economic position were such that the industry found itself facing fresh problems, solution of which was essential to any scheme of railway modernisation. As Mr. Shipp pointed out, the difficulties were tackled with initiative and resource in an attempt to reduce costs and provide more scientific forms of marshalling yard apparatus, remote control, and equipment fitted to function with 50-cycle electrification. For the last-named, valuable experience gained in France could be drawn on.

The address contained a plea for helpful co-operation from the railway side in removing difficulties originating in the days of the separate companies and exemplified in variations in practice which experience shows can never be eliminated without a considered policy backed by determined efforts. Other nationalised railway systems have had similar troubles to overcome. Co-operation between the railways and the signalling industry already has accomplished much and may be regarded as symbolised by the election to the Chair of the Institution of one who has been intimately associated with the production of much apparatus now giving valuable service to railways in Britain and overseas.

British Transport Commission Traffic Receipts

IT is disappointing that British Railways passenger receipts for Period 4, the four weeks ended April 19, should have exceeded the corresponding figure for 1958 by only £7,000. The Easter holiday was included in the period both this year and last, and the weather at Easter, 1958, on the whole was worse. London Transport Underground receipts made a better showing, exceeding last year's total by £49,000.

The decline in L.T.E. bus and coach receipts continues

	Four weeks to April, 19 1959		Incr. or decr.	Aggregate for 16 weeks		Incr. or decr.
	1959	1958		1959	1958	
Passengers—	£000	£000	£000	£000	£000	£000
British Railways ...	10,529	10,522	+ 7	35,977	35,694	+ 283
London Transport : Railways ...	1,807	1,758	+ 49	7,284	7,207	+ 77
Road services ...	4,103	4,372	- 269	16,029	17,560	- 1,531
Provincial & Scottish buses ...	4,318	4,259	+ 59	16,337	16,362	- 25
Ships ...	441	440	+ 1	1,135	1,064	+ 71
Total Passengers ...	21,198	21,351	- 153	76,762	77,887	- 1,125
Freight, Parcels						
Mails—						
British Railways : Merchandise & live- stock ...	7,127	7,951	- 824	29,825	33,456	- 3,631
Minerals ...	3,190	3,756	- 566	13,676	15,617	- 1,941
Coal & coke ...	8,189	9,937	- 748	38,135	42,270	- 4,135
Parcels, etc., by pas- senger train ...	4,031	3,991	+ 40	15,876	15,787	+ 89
Total Freight British Railways ...	22,537	25,635	- 3,098	97,512	107,130	- 9,618
Others ...	4,021	3,985	+ 36	16,028	16,170	- 142
Total Freight, Parcels, & Mails ...	26,558	29,620	- 3,062	113,540	123,300	- 9,760
Total ...	47,756	50,971	- 3,215	190,302	201,187	- 10,885

with traffic for Period 4 totalling £4,103,000, against £4,372,000 in 1958, and £4,138,000 for Period 3 of the current year.

Most people make their Easter holiday plans for travelling to the Continent or to Ireland well in advance. The early incidence of Easter this year may help to account for British Railways ships' passenger receipts exceeding last year's total for Period 4 by only £1,000. On the other hand, the increase in travel by railway steamers noticeable in the earlier weeks of

this year, before the holiday season, may have been due to a growth of business and other travel, as by immigrants, not on holiday.

Freight traffic receipts are dismal reading. The total freight receipts of British Railways for Period 4 are £3 million below last year's figure, which itself was unsatisfactory. The low levels of mineral receipts, which reflect industrial activity, and of merchandise traffics, which might have been expected to respond more favourably to the efforts being made by railway traffic staffs, are particularly disappointing. The reduction in coal class traffics, consequent on the reduced demand for coal, was to be expected. Even so, a drop of nearly £750,000 compared with last year's meagre total for Period 4 is a serious matter. Total receipts from the other freight-carrying activities of the Commission slightly exceeded the corresponding figure for 1958.

The first 16 weeks of 1959 ended with total traffic receipts by the Commission of £190,302,000, or nearly £11 million less than a year before.

PERCENTAGE VARIATION 1959 COMPARED WITH 1958

	Four weeks to April 19	16 weeks to April 19
British Railways—		
Passengers	+ 1.0	+ 0.7
Parcels	+ 10.3	+ 0.5
Merchandise & livestock	+ 15.0	+ 10.8
Minerals	+ 17.5	+ 12.4
Coal & coke	— 8.5	— 9.7
Total	+ 0.2	+ 6.5
Ships (passengers)	+ 0.9	+ 6.6
British Road Services, Inland Waterways and Ships (cargo)	+ 1.3	— 0.8
Road Passenger Transport, Provincial & Scottish	+ 2.7	— 0.1
London Transport—		
Railways	+ 6.1	+ 1.0
Road services	— 3.5	— 8.7
Total	— 6.3	— 5.8
Aggregate	— 6.3	— 5.4

Push-and-Pull Trains

DOUBTS as to the safety, more particularly as regards derailment, of propelling a long rake of passenger vehicles at speed with the locomotive in the rear have been the chief reason for the limited extent to which push-and-pull trains have been operated. Apart from this, they afford, as does the diesel or electric multiple-unit train, quick turnrounds at terminals, with consequent better user of motive power and rolling stock and reduced platform occupation, and obviate running round the locomotive at a terminal, and the movements which that requires, also the provision of additional signalling, engine roads, and so forth.

So far as steam working is concerned in Britain, from the first introduction of steam push-and-pull workings by the North Eastern and London, Brighton & South Coast Railways in 1905, the maximum formation ever reached with trains of this type appears to have been four coaches, with the engine in the centre; but so far as is known not more than two bogie coaches were ever pushed by the locomotive in this way, and then only on local services. In France, however, from the middle 1930's both the Eastern and Northern regions have used powerful 2-8-2 tank locomotives on six-coach and even eight-coach formations. In the Eastern Region these are being increased to 12-coach sets on the Paris suburban services, and new sets being built are designed to facilitate changeover from steam to electrical working, i.e., replacement of the steam by an electric locomotive, which also will be controlled from the end coach when the locomotive is propelling. Speeds of 70 m.p.h. and more are attained with perfect safety by push-and-pull trains of the French National Railways.

Preparations are being made in Switzerland for electric locomotives or motor coaches to push up to 12 74-ft. 6-in. coaches on some of the fastest schedules in the country, on which speeds of 75 to 80 m.p.h. are attained. For some years push-and-pull train sets of seven of these coaches, with Bo-Bo locomotives of the "Re 4/4" type, have worked almost the entire express service between Lucerne, Zurich and Schaffhausen and between Lucerne and Berne, often attaining 75 m.p.h. and more, between Lucerne and Zug in particular. From May 31 new push-and-pull trains of the latest stock are to take

over many of the workings between Geneva, Lausanne, Berne, and Zurich, and between Geneva, Lausanne, Bienne and Basle. Even with trains of up to 12 coaches, almost 900 ft. long and weighing about 325 tons tare, 57-ton "Re 4/4" locomotives will be used. Other trains will be worked by a new type of electric motor coach, which will have the advantage of adding 68 second class seats to the total accommodation. The intensive rosters to be worked will demand the strictest punctuality, in view of the brevity of many of the turn-round times at terminals.

The most remarkable rosters will be shared by two 11-coach sets, each powered by one of the new "RBe 4/4" motor coach units and providing 192 first class and 468 second class seats. In two days each of these will cover 1,711 miles, namely seven journeys over the 178 miles between Geneva and Zurich, one from Zurich to Brigue via Lausanne, one from Brigue to Geneva, and a return trip between Zurich and St. Gallen. Of the 11 reversals of direction on these two days, seven will be allowed only 10 to 19 min. apiece, in several cases between the full-length Geneva-Zurich runs. One 12-coach set with "Re 4/4" locomotive, covering 628 miles daily by two round trips between Geneva and Basle, will make 12 reversals daily, and the advantage of requiring no running of the locomotive round the train at each of these needs no stress. By the beginning of the winter service on October 4, eight new push-and-pull sets will be in service.

The restaurant car will be in the centre of each train, all the first class accommodation on one side, and all the second class on the other. Pneumatically-operated doors, under the driver's control, will be fitted throughout each train; the signal to start will be given by electric communication from the train, a push-button signal being provided in each coach for the purpose. While push-and-pull operation is not possible on some Swiss main line services, because of the through portions, both internal and international, that have to be marshalled on to and off the trains, the intention is to extend its use wherever possible to accelerate working throughout the country.

In view of the flexibility in working afforded by suitable designs of electric and even of diesel locomotives which can be used for both passenger and goods trains, the possibility of using such machines in push-and-pull working deserves study. Experience in France and Switzerland shows that there is no danger in operation, and the advantages are substantial.

Re-phasing of Indian Railway Plans

(By a correspondent)

WHILE the First Five-Year Plan of the Indian railways involved an expenditure of some £300 million, the second Plan was much more ambitious and provided for an outlay of approximately £1,050 million. Since the formulation of the second Plan, three factors have brought about modifications in its original structure. First, the plan had to accommodate itself within the reduced provision of £850 million. Secondly, with the rise in the cost of materials and labour, the physical targets had to be adjusted. Thirdly, because of the difficult foreign exchange position, the foreign exchange element had to be scaled down from £320 million to £293 million.

The principal items of expenditure under the railway plan are: rolling stock; line capacity works including expansion of goods; track renewals; electrification; new lines; workshops, plant and machinery; passenger amenities; staff quarters and staff welfare; eight-wheel bogie wagons; replacement of screw by automatic centre buffer couplers; mechanical handling at some important goods depots; mechanical equipment for marshalling yards; and C.T.C.

The pace of production of rolling stock in India has steadily accelerated. During 1957-58, the Chittaranjan Locomotive Works produced 164 locomotives, making a total of 320 since the commencement of the second plan and 668 since the commencement of production in 1950. Production of coaches at the Integral Coach Factory, Perambur, was 222, making a total of 322 produced in the factory since its inception. The year also saw substantial progress in the output of wagons and coaching underframes from established wagonbuilders in the country. Of the 29,634 wagons of all gauges placed on the line during the year, 17,216 were from indigenous sources.

Similarly, out of a total of 1,408 coaching vehicles, only 164 were imported. The total investment on Indian railways on March 31, 1958, including lines under construction, amounted to £1,050 million. The total capital outlay on railways in pre-Partition India was £600 million.

The third year of the plan has seen the peak of constructional activity on the railways. During the year nearly 1,500 engineers and engineering supervisors at various levels and about 200,000 workers have been working on the various projects, apart from workmen engaged on track renewal and other normal railway works. Out of the total of 1,848 miles of new line and doublings under execution, while 423 miles (173 miles of new line and 250 miles of doubling) have been opened to traffic during 1958-59, construction is in hand of 525 miles of new line.

The Third Five-Year Plan provides for building of some 500 miles of new line: Udaipur-Himmatnagar, Juhnd-Kandla, Tildanga-Farakka, Khajuriaghat-Malda, the Delhi avoiding line, and the extension of the railhead from Madhopur across

the Ravi into the State of Jammu & Kashmir. Of the new projects, construction of Gunna-Ujjain and Bakhtiarpur Rajgir links will commence during 1959-60 as well as the 115-mile Sambalpur-Titlagarh line and the connection between Bimlagarh and Kiriburu, required to carry 2,000,000 tons of iron ore for export to Japan through the port of Vizagapatnam.

As regards a.c. electrification, orders for supply and erection of overhead equipment have been placed for several sections of the Eastern and South Eastern Railways. Manufacture to an increasing extent in India of the mechanical parts of electric locomotives is being encouraged by the Railway Ministry. A start is to be made with the parts of imported knocked-down locomotives. The electric components for the indigenously manufactured electric locomotives may have to be imported in the initial stages, until these can be supplied by the heavy electrical plant set up last year in Bhopal. The development of indigenous capacity for the manufacture of diesel locomotives has also been taken in hand. At Chittaranjan, a 7,000-ton capacity steel foundry is being set up.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of Correspondents)

U.S.A. Railway Passenger Traffic

April 25

SIR,—A paragraph on page 477 of yesterday's *Railway Gazette* suggests that railways in the Middle West and Western States are for the most part holding their own in the passenger field. Unhappily a scrutiny of trends in the last three years does not support your conclusion.

Compared with 1956, passenger revenue in 1958 declined by 10 per cent in the Western District, and by 10.3 per cent in the Eastern District, despite an increase of 5 per cent in fares early in 1957, and sundry advances in charges later. The largest carrier in the West, the Santa Fe, and the Pennsylvania, both lost 13 per cent of their 1956 revenue. Details for 1958 are not yet available, but in 1957 the Santa Fe carried 2,821,540 passengers, 11 per cent fewer than in 1956, for an average distance of 629 miles at a fare of nearly \$15, while the Pennsylvania carried 58,742,600 people, 6 per cent fewer than in 1956, for 58 miles, on payment of \$2.07 apiece.

Railroads on either side of the Mississippi are in the same predicament. Operating costs rise faster than passenger takings. In 1957, the Santa Fe withdrew passenger services from 242 miles of road and reduced passenger train-hours by 24,360, or nearly 6 per cent. The Pennsylvania cut passenger train service by 5,700 train miles a day, or 12.5 per cent. No railroad makes a worthwhile profit from passenger train operations which have ceased on nearly 50,000 miles of road during the past 12 years.

Yours faithfully,

R. BELL

Clacton-on-Sea

Railway Superannuitants

April 30

SIR,—Referring to the letter from Mr. R. C. Heney, published in your April 24 issue, I feel it is misleading in many respects, but in particular that it states that the Transport Salaried Staffs' Association and the National Union of Railwaymen had been unwary in allowing the funds of the various superannuation schemes to be dissipated. On the contrary, it was as a direct result of the action taken by the Transport Salaried Staffs' Association at the time that the former railway companies were persuaded to put their respective superannuation schemes on a proper financial basis and to maintain the solvency of these funds by annual contributions.

The guaranteed interest on railway superannuation funds has been maintained at 4 per cent throughout, including the long years of recession, and whilst the T.S.S.A. has no control over the investment policy, it is noteworthy that, notwithstanding the effect upon superannuation funds of national inflationary tendencies since the war, the rates of contribution, and the solvency guarantees, remain intact.

We have made strong representations to both the British Transport Commission and the Government, further to improve the meagre supplementations now made to the pensions of B.T.C. superannuitants who have suffered acutely from persistent rises in the cost of living. There is no justification for further delaying a decision in the matter, as the passage of time sees an inevitable decrease in the number of retired staff affected, with a corresponding reduction in the Commission's liability for supplementation. It behoves the Commission and the Government really to try to improve the lot of these unfortunate old servants who are now having to eke out an existence on inadequate pensions.

I would finally add that the Treasury is not subsidising the B.T.C., as the Commission has to pay interest on all money borrowed from the Government under recent transport legislation.

Yours faithfully,

W. J. P. WEBBER
General Secretary

Transport Salaried Staffs' Association,
Walkden House, 10 Milton Street, N.W.1

Two-car Sets for Kent Coast Line

April 25

SIR,—In a recent issue you reviewed the benefits which the passengers should expect from the inauguration of Stage 1 of the British Railways, Southern Region, Kent Coast electrification and you included riding comfort. I sincerely hope you are right but I have my doubts, judging from recent experiences.

The two-car half-corridor sets introduced on the Gillingham and Maidstone services when these were electrified in 1939 were the best-riding electric stock on the Southern and after nearly 20 years' service one could read in them in comfort. Last autumn they were withdrawn and replaced by new two-car sets and from the very beginning the riding of most of these coaches can only be described as very bad. It is the worst on standard-gauge track in my experience, which covers most countries in Europe and 9,000 miles within the U.S.A. It is a penance to try to read in some of these coaches, and passengers new to the line look up with apprehension after some of the more violent lurchings.

I have always had a great admiration for the Southern Electric since I had my first season ticket 30 years ago. In sorrow, and not in anger, I protest against the rolling stock now inflicted on us. But let me give credit where it is due, the new sets have a balancing speed up the 1 in 100 gradients of the North Downs, which is at least 10 m.p.h. faster than their predecessors.

Yours faithfully,

G. M. BARRETT

30, Pilgrims Way East, Otford, Kent

THE SCRAP HEAP

Compliment

We frequently hear complaints about British Railways' staff, but I have always found them most co-operative. In fact, I have never yet come across a station-master or any other member of British Railways who has not done his or her utmost to help. I travel to many provincial engagements by car, but on occasions it is more practicable to go by train. I feel that I am, therefore, able to speak with some authority about British Railways' employees.—Mr. Joe Loss, in a letter to the "Sunday Dispatch."

Gold Mine Refuse for New Railway

Tailings from once rich gold mines in the Wangaratta district are providing the gravel for concrete for bridges and other civil engineering work on the 4-ft. 8½-in. gauge line being built by the Victorian Railways from Melbourne to the New South Wales border at Wodonga where connection is made with the N.S.W. Government Railways. Some farmers and graziers, whose properties adjoin the line have already benefited from the project as excavations for material for earthworks have provided them with free dams for water storage, in exchange for the excavated earth.

"Port to Port"

Many people have admired the poster reproduced in the accompanying illustration. It is by Terence Cuneo and produced by the department of the Public Relations & Publicity Officer of British Railways, Southern Region.

A correspondent draws attention to a distinctive feature. Close inspection of the poster will reveal, at the base of the pedestal of the ship's telegraph on

the right of the picture, a rat disporting itself and seemingly unconcerned at the presence of the navigating officer and the quartermaster on the bridge. He wonders whether its presence there is a reflection on efficiency in keeping down these vermin in British Railways' ships. The rat seems in no way anxious to leave the ship, and may, therefore, be a good omen.

Many railway posters by Terence Cuneo in fact, include a rat somewhere in the picture.

Rail Excursions for University Course

Three Saturday afternoon excursions from Glasgow over early-built railway routes have been arranged by British Railways, Scottish Region, in connection with a special course of five lectures on early canals and railways at Glasgow University. The purpose of the course, which has been arranged by Glasgow University Extra-Mural Education Committee in collaboration with the Education Authority of Glasgow, is to study communications in the West of Scotland in the early 19th century and their influence on the Industrial Revolution.

On May 2, for instance, a former Caledonian Railway 0-6-0 locomotive, hauling two ex-Caledonian coaches in the original chocolate and cream livery, left from Glasgow Central for Kirkhill, Lesmahagow, Stonehouse, Strathaven, Larkhall Central and Hamilton Central, whence the train was routed via Motherwell and Bellshill to Glasgow Central. A trip on May 16 will be from Glasgow Queen Street to Aberfoyle and back. On May 28, a party will leave Glasgow Queen Street, Back o' Loch Halt, for an inspection of Kirkintilloch Basin on the Forth & Clyde Canal. The train will go

on to Maryhill Locks, where a talk on the history of the canals will be given by a British Transport Waterways representative.

Rail-and-Air Service (1929)

Imperial Airways have obtained new aeroplanes and flying boats, the latter of which will be used between Genoa and Alexandria, for the new service between Croydon and Karachi. One stage, between Bâle and Genoa, will be covered by railway in a sleeping car train.

The total time for the 5,000-miles journey by aeroplane, flying-boat, and train will be 6 days 4½ hours, as compared with about 15 days by existing routes. The total time spent in the air will be 52 hours.

The provisional time-table, as now drawn up for the departure of the first aeroplane from London, is as follows:

Croydon, Saturday	... 5.45 a.m.
Paris	... 8.15 a.m.
Bâle, Switzerland	... 12 noon
Genoa, Italy, Sunday	... 2.40 a.m.
Rome	... 9.0 a.m.
Syracuse, Sicily	... 2.45 p.m.

(Thence via Navarino (Greece), Tobruk, Alexandria, Baghdad and Basra to Karachi, due 10.30 a.m. Friday.)

The passenger fare will be about £130—From "The Statesman" (Calcutta) of March 1, 1929.

[The train journey from Basle to Genoa was the result of the refusal of the Italian authorities to allow aircraft to fly over Italian territory when coming from France. The quickest surface journey from Britain to India was probably by "P. & O. Express," from Victoria to Folkestone and Boulogne to Marseilles, thence by P. & O. mail steamer to Bombay. The time taken was 14 days. Travel via Trieste or Brindisi in 1929 was no quicker.—Ed., R.G.]

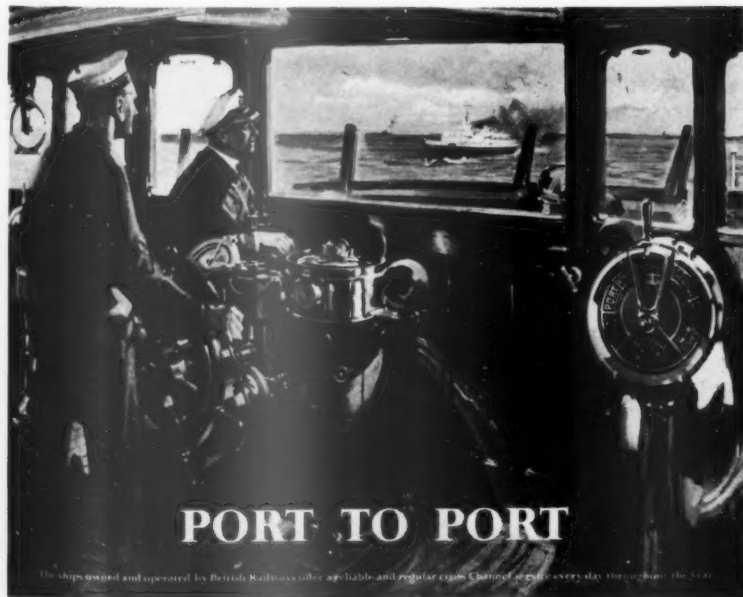
Driverless Platform Trucks

(See our April 24 issue)

It must be extremely jolly
Watching the odd platform trolley
Starting, stopping, to-and-fro-ing,
Knowing naught of where it's going,
Guided by remote control
From some unseen glory-hole.
But, before these strange inventions
Grow to untoward dimensions,
Let us take another peek
In the crystal, so to speak.

Day by day it's getting clearer
That the time is drawing nearer
When man's ingenuity
May bring superfluity
To the dignity of labour
And one's duty to one's neighbour.
Robot gadgets, everywhere,
Helicopting here and there,
Put a query mark on man.
Will he build a nobler plan,
Or, in lotus-eating plenty,
Drowns in *dolce far niente*,
Wake to find that he must still,
Willy-nilly, pay the bill?

A.B.



Southern Region poster which, like other posters by Terence Cuneo, includes a rat (by the pedestal of the ship's telegraph)

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

BELGIAN CONGO

Otraco Lines

All Otraco railways showed reduced traffic and receipts during 1958 as a reflection of the poorer general trading situation in the Congo; and the 58-mile 3 ft. 6 in. Kivu Railway (Kivu-Kalundu-Uvira-Kamaniola) was closed in December, and a lorry and bus service substituted over the Uvira-Usumbura-Bukavu section. Traffic during the last 11 months had amounted to 62,000 tons of freight and 7,800 passengers. On the Matadi-Leopoldville line centralised traffic control was inaugurated in October over the 55-mile Leopoldville-Sona-Bata section. On the 85-mile 2-ft. gauge Mayumbe line, north of the Congo river, passenger-train service was withdrawn and replaced by a bus service; number of passengers a year averages about 12,000.

SOUTH AFRICA

New Catering Depot at Johannesburg

Good progress is reported on the work started on the new catering depot at Johannesburg. The designers have concentrated on mechanisation wherever possible. Reception and despatch offices are on the ground floor. The main depot will consist of two separate blocks, one for the warehouses and the other for the staff. The warehouse will be of five floors and the administrative side eight floors. Additional floors have been provided for. Loading bays and six covered platforms, 8 in. above (3 ft. 6 in. gauge) rail level, will be used to service refreshment cars.

Wherever possible diamond mesh steel partitions will be erected in place of brick walls to improve ventilation and provide better control and supervision. The stores will be located on upper floors. A large deep freeze and several

refrigerator rooms, linen stores, and a specially designed kitchen for demonstrating new techniques to trained staff are all part of the main stores building. The liquor and grocery stores will be in the basement. The rest rooms for staffs of refreshment cars from other stations are about 200 yd. from the new depot. It will not be necessary for cars being moved to and from the depot to cross the running lines, as a six-track reception yard with avoiding line has been built.

ETHIOPIA

Franco-Ethiopian Railway in 1958

Although the goods traffic handled by the 487-mile metre-gauge Franco-Ethiopian Railway in 1958, was, at 254,334 tonnes, approximately the same as in 1957 (253,968), its structure differed. Import traffic from Djibouti, at 127,305 tonnes, exceeded that attained in 1957 (102,970 tonnes) by 24 per cent. Export traffic from Addis Ababa fell by 38 per cent from 76,394 to 47,235 tonnes, while internal traffic rose by 6 per cent.

VICTORIA

Superphosphate Traffic

A record for the carriage of superphosphate was established by the Victorian Railways in February, 113,185 tons, compared with the previous record of 110,084, in February, 1958. It was expected that the upward trend would continue. Additional trackage between North Geelong and Corio and diesel-electric locomotives have enabled the Victorian Railways to meet all demands for fertiliser.

Growth of Diesel Railway Traction

The Commonwealth Bureau of Census & Statistics has published some interesting information regarding the growth

of diesel-electric locomotives in Australian Railways. In 1951 only 12 main-line diesel-electric locomotives were in operation. Six years later this number had increased to 269 with a further 46 available for shunting duties. Diesel locomotives now haul 17 per cent of the revenue train mileage compared with less than 5 per cent in 1952-53. The total number of locomotives in use on Australian Railways is decreasing in spite of an increase in train mileage, thus emphasising the overall improvement in power and speed which the diesel-electric locomotive has brought about.

Locating Missing Aircraft

The Victorian Railway system of communication is now available for help in searches for missing aircraft. When the Police Department requires railway co-operation in a search it will communicate with the chief train controller at Melbourne who is in telephonic communication with every station. Train control will be informed of the type of aircraft, the time it was last sighted, places of departure and destination, and the direction of flight. These particulars will be passed on to the railway districts concerned. Stationmasters will inform staff and guards of trains and ask them to report hearing or sighting aircraft of the type described with approximate time of location and direction of flight.

NEW ZEALAND

More Timber Wagons

The Timber Merchants' Federation has expressed its thanks to the Minister of Railways, Mr. M. Moohan, and to the General Manager, Mr. A. T. Gandell, because the 1958-63 rolling stock programme includes 300 special "Nc" timber wagons.

UNITED STATES

Mechanised Inter-Line Accounts

The Illinois Central, Union Pacific, and Southern Railroads have brought into use a system whereby their inter-line freight accounts are settled by the exchange of a roll of magnetic tape and the cheque. The magnetic tape replaces the large stacks of inter-line abstract sheets which previously were exchanged every month between the railways concerned. Now the tapes are fed into the data processing machines in use on each of the three railways. In these accounting is automated and verified automatically, minimising errors and greatly speeding up the work.

Road Competition for Passengers

The Port of New York Authority, the City of New York and certain motor carriers are joining with the Pennsylvania Railroad in opposing a proposal to operate luxury limousine motorcars by road on a 4½ hr. schedule each way over the 225 miles between New York and



Five-floor warehouse block of catering depot under construction near west end of Johannesburg Station, South African Railways

Washington. The proposed limousine fare of \$12.50 one way or \$20 return would compare with the present single journey parlour car fare of \$18.88 by rail even without the Federal tax. The Interstate Commerce Commission examiner has recommended the limousine plan to the I.C.C. The train journey normally takes 3 hr. 35 min. to 4 hr.

Pennsylvania Signalling Altered

Until now the position-light signalling employed on many of the principal main lines of the Pennsylvania Railroad has shown three amber lights horizontally as the "stop" indication. For better visibility, these are now to be changed to two red lights, thereby bringing the Pennsylvania into line with most other American railways which use red as their stop aspect.

B. & O. Wagon Reporting

The Baltimore & Ohio Railroad is installing Teletype machines, using punched cards, for reporting the movement of goods trains and individual wagons. This installation will link 69 marshalling yards throughout the system, and later will be co-ordinated with the B. & O. electronic computer, which has just started operation. The latter, first used for the calculation of payrolls, will digest the wagon information for wagon accounting and freight revenue purposes.

BRAZIL

Manufacture of Railway Material

The report by the study group appointed by the Economic Commission for Latin America (ECLA) to investigate the position as regards production and needs of railway material in Argentine, Brazil, Chile, and Uruguay, stresses the precarious condition of the railways in those countries. Equipment, it reports, is old. Heavy deficits restrict renewals and excessive use of old material aggravates financial losses, so creating a vicious circle. To replace obsolete equipment it is recommended that the railways concerned embark on a 10-year programme, providing for purchase of 6,000 goods wagons and 480 passenger coaches a year, besides motive power and signalling and other equipment.

As regards production capacity Brazil is in a favourable position. Brazilian manufacturers of railway materials are stated to be able to supply the deficiencies of the Argentine and Uruguayan markets with 7,000 wagons a year, 2,500 being reserved for the Brazilian railways.

Permanent Way Work

The National Railways finished laying 637 miles of new lines in 1958 and placed orders with private contractors for the relaying of 788 miles of permanent way and 50 shunting yards and the rebuilding of 14 maintenance shops. The last of the deviations to the Sertao line, planned to facilitate exports of iron ore from Minas Gerais, has been completed and the Lins-Aracutuba deviation on the Noroeste do Brasil Railway is nearing completion. On the Parana-Sta. Catarina Railway 60 miles of permanent way were renewed last year, the Maringa-Agua Boa section was opened to traffic,

diesel traction was established between Corupa and Videira, 335 miles, on the Paranapanema branch, increasing train lengths to 50 wagons, and is about to be introduced from Videira to Curitiba, the capital of Parana.

Freight carried over the incorporated railways increased by 5 per cent between 1957 and 1958, and passengers per kilometre by 6.8 per cent.

SWITZERLAND

Coach with Pneumatic Suspension

Some years ago the Federal Railways built a second class coach with two 10-wheel bogies, of which all wheels were fitted with pneumatic tyres of the type having limited use at that time in France. The Swiss experiment had no marked success, however, and for most of its life this coach has been confined to local working between Puidoux-Chexbres and Vevey. It has now been rebuilt with four-wheel bogies and steel-tire wheels, but in place of springs the suspension is pneumatic, of a type similar to that employed in the General Motors "Aerotrains" in the U.S.A.

Four rubber bellows transmit the weight of the coach-end to the bogie, and the air pressure in each is automatically adjusted to compensate for variations in the weight of the passenger complement. The pressure increases when the coach is full and is reduced proportionately if it is half-empty or empty. The level of the buffers and couplings above rail remains constant. The air pressure is supplied from the brake reservoir. This coach is now in experimental service in a push-and-pull train.

Brienzer-Rothorn Railway

Replacement of one of the last remaining steam-operated railways in Switzerland, from Brienzen in the Bernese Oberland to the summit of the Rothorn, by a suspension line is not yet under consideration. The management states that steam working is likely to continue during the summers of 1959 and 1960. During the winter the line is closed. It is 4½ miles long and climbs 5,515 ft. The main purpose of substituting suspension transport would be greatly to accelerate the journey and to cut working expenses.

FRANCE

Push-and-Pull Trains

In accordance with the decision to operate certain suburban services from and to Paris Est with steam push-and-pull trains, pending the completion of electrification in 1962, the first such train was put into operation in June, 1958. By February last nine trains, four of eight and five of five coaches each, were operating. It has now been decided to supplement these by at least a further 12 trains. These will be designed to enable them to be converted to electric push-and-pull operation at a few days' notice, so that the steam can be replaced later by electric locomotives.

At a later date the trains will be replaced by multiple-unit electric sets. So far, only four prototypes have been ordered for trials, after which orders will

be placed for the most suitable design. It is unlikely that push-and-pull operation will be completely dispensed with until 1967.

WESTERN GERMANY

Berlin Connections

With the summer timetables beginning May 31, Berlin and the Federal Republic of Western Germany are to be connected by 10 pairs of trains each day. Three pairs connect with Hamburg, via Schwandheim and Buchen; four pairs connect with Cologne, via Marienborn, Helmstedt, and the Ruhr; two pairs connect Munich, via Probstzella, Ludwigstadt, and Nuremberg; and one pair connects with Frankfurt and Basle, via Wartha and Bebra. Through-carriages for destinations outside Western Germany are included in some of the train pairs, e.g., Warsaw-Berlin-Hook of Holland, Berlin-Munich-Gladbach-Aachen-Ostend, Berlin-Frankfurt-Paris, and a *courette* Malmö-Berlin-Munich.

HUNGARY

Named Trains

The express diesel railcars which run in summer between Budapest and the resorts on Lake Balaton are to be given names. The two services to Keszthely and Tapolca via Balatonszentgyörgy will become the "Balaton Express" and the "Helikon Express," and two new services will run to Siofok ("Sio Express") and to Tapolca via Balatonfüred ("Badacsony Express"). Until now, the only named trains in Hungary have been the various international expresses.

CZECHOSLOVAKIA

Courette Coaches

Second class *courette* coaches will be placed in service on four internal routes this summer, from Prague to Kosice, Medzilaborce, Plesivec and Zvolen. The Czechoslovak State Railways are the second administration in Eastern Europe to introduce *courette* accommodation; the first was the East German State Railway in 1957.

NORWAY

New Goods Wagons

The State Railways intend shortly to place orders for 6,000 goods wagons to the value of Kroner 300,000,000, or £15,000,000 at the present rate of exchange. It is reported orders are to be reserved for Norwegian industry.

U.S.S.R.

Sliding Doors on Metro Platform Edge

In a station being built on the Lenin-grad Metropolitan railway sliding doors are to be mounted in bays in the walls of both sides of the station hall. An electronic device will ensure that when the train stops, the doors of the station and of the carriages are positioned opposite each other and open and close simultaneously. One object is to facilitate the eventual operation of driverless trains.

New Passenger Terminus at Capetown

Progress on 24-platform structure including motor-car park, and on railway administrative offices



Railway administrative offices under construction on left, platforms of new terminus on right centre, and, beyond, tracks approaching existing terminus

THE new passenger terminus at Capetown, South African Railways & Harbours, and the new railway administrative offices adjacent are scheduled for completion by the middle of 1964 and the end of 1960 respectively. The two buildings with their grounds will cover an area of 39 acres. The station is being built on a new site on the seaward side of the present station. The track between Capetown and Woodstock is being relaid and Woodstock Station has been rebuilt. Work was started in 1955 and the expenditure to date is £1,408,000.

Facilities

The station will have 24 platforms, of which five will be for main-line trains, two for trains for non-Europeans, and the remaining 17 for the suburban trains serving the Bellville, Cape Flats, and Simonstown lines. The main-line platforms will be approximately 1,500 ft., and the suburban platforms about 740 ft., long. A concourse will run along the terminal end of all the platforms.

The main station building, fronting on Adderley Street and situated opposite the ends of the main-line platforms, is to be a four-storey building. Besides the air terminal office, provision is being made on the ground floor for reservation offices, a tea room, and a bar. The first floor will be occupied by publicity offices, a restaurant, lounge, kitchen, and a tea balcony overlooking the main concourse. The second and third floors will accommodate the station personnel.

Main-line platform No. 24 will be flanked on the seaward side by a parcels building 500 ft. long to handle all parcels

and incoming baggage, and a baggage wing. There will be four dock platforms for the working of baggage and parcels traffic. The main concourse, running the full width of the 24 platforms on the Adderley Street side, will have ticket offices and waiting-rooms for Europeans.

A pedestrian subway under the extended street will give access from the concourse to the parade.

Non-European station facilities such as

ticket offices, restaurants, and toilet facilities will be provided in two separate buildings straddling the tracks at the entrance to the station, and vehicular access will be from the new Pirow Street bridge which crosses the station area at that end. These two buildings will house the main line and suburban facilities respectively.

"Station Deck"

Certain portions of the platform area will be covered by an overhead structure known as the "station deck," with a surface area of 500,000 sq. ft. The estimated cost of £1,200,000 is being shared by the Capetown City Council and the Foreshore Board.

On the deck there will be a pedestrian concourse 226 ft. wide running across the middle of the platforms and linking the foreshore area with the parade. A further covered area over the main-line platforms will provide parking for some 375 motorcars and road access will be from the parade, from the foreshore and from Pirow Street bridge.

Facilities for postal traffic are being installed at a cost of nearly £500,000 and will consist of a room for sorting mails underneath the main-line platforms and the distribution of these mails by conveyors through tunnels between the post office in Parliament Street and the mail room, and also for incoming mail between the Woodstock end of the station and the mail room. Incoming mail will be fed directly from each main-line platform into chute houses connected with the postal tunnels and conveyor systems.

Work is at present confined to the



Platforms of new station under construction, showing part of present passenger station in background

construction of platform walls and roofing, postal tunnels and pedestrian subways.

The new station is being opened in stages as the work is completed: *Stage 1*: Introduction of Woodstock Station on its new alignment (completed in December, 1958); *Stage 2*: Opening of the new main-line station (platforms Nos. 20-24) with limited passenger facilities in March, 1961; and *Stage 3*: Introduction of additional platforms, Nos. 12 to 20, but exclusive of the suburban concourse, in September, 1962, when all the Bellville and Cape Flats trains will depart from the new station; *Stage 4*: Introduction of platforms Nos. 5 to 11 in March, 1964, at which stage the old station will be abandoned and the Simonstown trains will also depart from the new station with limited platform facilities; and *Stage 5*: Introduction of

the remaining four platforms and quadruple lines between Capetown and Woodstock for extended facilities for Simonstown trains.

Much of the work is being done by private contractors and tenders have been accepted or are being adjudicated for the piling foundations for the station deck; substructure and anchorage for the mail chamber; the new parcels block; the first portion of the deck structure; and the new signalbox at Capetown.

In addition, plans and specifications are in the course of preparation for two bridges which are to be built across the new station yard and which must be built concurrently with the new station. They are the Pirow Street bridge which will connect Sir Lowry Road with the foreshore and which will also serve as road access to the non-European station, the deck, and the Hertzog Boulevard

which will link the Boulevard East with the foreshore area. These two bridges will be constructed at the cost of the Capetown Foreshore Board.

The new administrative office block, which will accommodate about 1,200 people, is being built on the sea side of the new station buildings with the main entrance on the north side and with Adderley Street on the west. The building will consist of a basement, ground floor, and 14 floors above.

The foundations for the building and basement were let to contract in September, 1955, and completed in August, 1956. The superstructure, except for electrical and communications work which is being done departmentally, was let to contract in September, 1957, and will be completed during the latter half of 1960. Structural concrete work on the basement and 11 floors is complete.

Indian Power-worked Automatic Crossing Barriers

Warnings and lifting barriers controlled by treadles and track circuits

IN India there are many level crossings in and around towns carrying heavy road and often considerable rail traffic also. At Lucknow, on the Northern Railway, experimental automatic power-worked lifting barriers have been installed on the double-track connection between the main station and the locomotive depot. Rail speeds over it are, therefore, abnormally slow, but the average number of daily locomotive movements is 180 and road traffic is considerable.

Automatic warning of the approach of a locomotive and of the closing of the barriers against road traffic is initiated by the depression of a mercury treadle by the locomotive, but in view of the low speeds this treadle is distant only 600 ft. on one track and 700 ft. on the other from the crossing. Depression of the treadle causes a bell to begin ringing and a red light to begin flashing as a warning in each direction to approaching

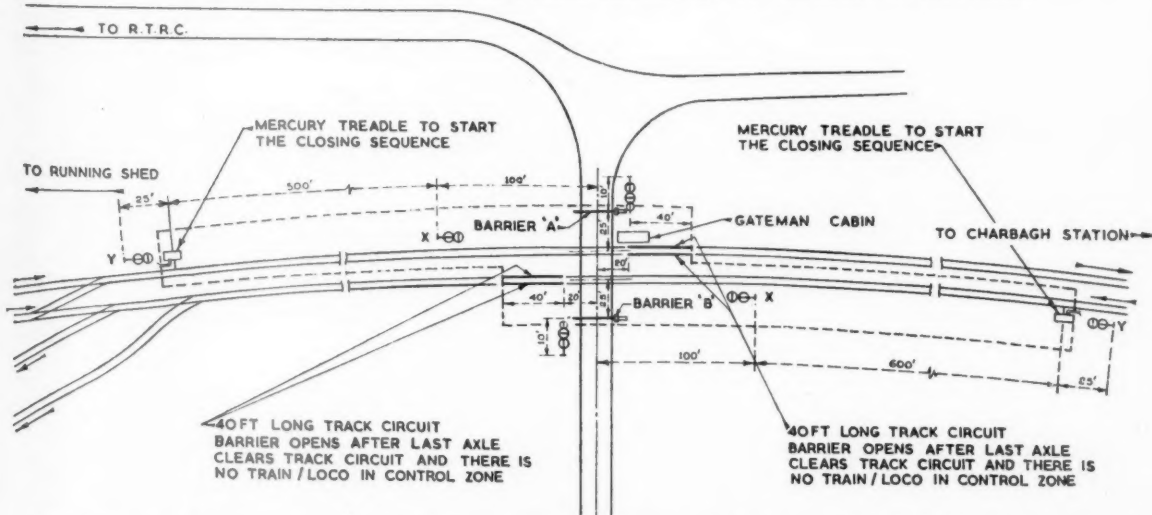
road vehicles. After these oral and visual warnings have continued for 15 sec., the automatic barriers begin coming down from vertical to horizontal across the roadway, this movement occupying 25 sec. On its completion the bell stops ringing and the red light becomes steady.

The up and down rail tracks are each protected by a two-aspect colour-light signal, again only 100 ft. from the crossing in view of the speeds prevailing. As soon as the barriers have come to rest across the roadway the aspect of the signal changes from red to green.

On passing over the treadle, the engine re-sets the signal against following rail traffic. Immediately beyond the crossing it traverses a 40-ft. length of track-circuited track. When the last axle of the engine or train clears it, the lifting barriers begin to rise again and re-open the crossing to road traffic. In the event of a road vehicle becoming trapped

between the two barriers, there is room for it to park clear of rail traffic, as each barrier is set back 25 ft. from the centre of the nearer track.

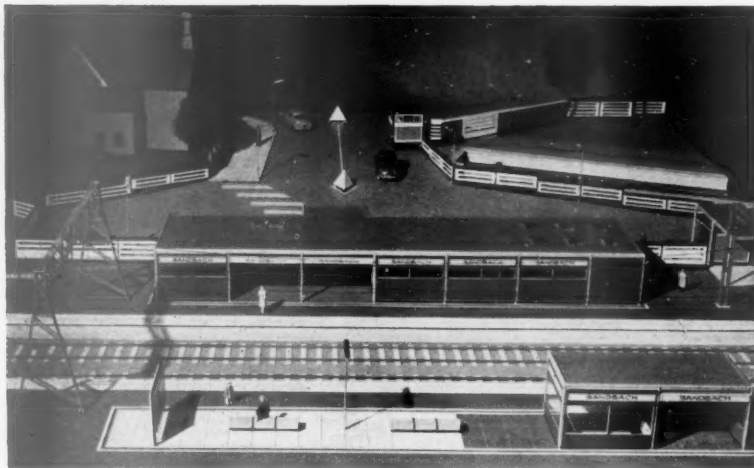
The whole installation is electrically worked, current being supplied by 24-V. lead-acid batteries trickle-charged through a rectifier from the a.c. mains. In this way supply interruptions are avoided, unless the period of the interruption in the mains supply extends to hours. In the unlikely event of such an emergency one gateman, primarily provided to ensure freedom from traffic obstruction and to clean flange-ways, can operate the barriers manually. He has an emergency switch with which he can put the signals to danger. In the event of a locomotive approaching and entering the controlled zone from each direction simultaneously, the barriers will not lift until the last axle of each has cleared the track-circuit.



Location plan of automatic barrier gate and associated track circuits near the locomotive shed, Alambagh, Lucknow

Pre-fabricated Stations for the L.M. Region

Modular steel frame structures for electrified lines



Model of station to be built at Sandbach, on the Crewe-Manchester line, showing module design of pre-fabricated structure

BBRITISH Railways, London Midland Region, has successfully developed a system of pre-fabrication for small and intermediate size stations. Tenders have been invited for the re-building of several stations on this system on the Manchester-Crewe electrified line.

Early in 1957 it was realised that the modernisation and electrification of the main line from Euston to Manchester and Liverpool would automatically result in an appreciable amount of station rebuilding. A development group was, therefore, formed in the Regional Architect's office to study the problem.

The immediate problem was to rebuild the stations at Burnage and East Didsbury, on the Styal line between Manchester and Wilmslow, within a year. It was decided to treat these two stations as prototypes for the pre-fabricated system and, because of the short time available a proprietary modular steel frame was chosen for the structure. Research was concentrated on the development of suitable cladding panels, partitions, roof units, and other elements. The experience gained from this Mark I system was immediately applied to the development of the Mark II system, in which all elements were specially designed.

Mark II System of Construction

The first building in the Mark II system is the small waiting shelter at Heald Green. Others which will commence shortly include the total reconstruction of the stations at Sandbach, Chelford, and Holmes Chapel, a booking office and waiting room at Mauldeth Road, and a waiting shelter at Goostrey.

The Mark II system, which is planned on a 40 in. module, consists of four main dry constructed elements; the aluminium structural frame, the roof units, the external wall panels, and the internal

partition units. The aluminium structure consists of a pin-jointed frame of cruciform section columns and rectangular beams. Both columns and beams are built up by fixing two extremely light extruded sections together to form the complete section. Although the structure is pin jointed and theoretically braced by the external wall panels, there is sufficient rigidity in the connections to allow the frame to be stable until these are fixed.

The possibility of using a system in which loads are carried directly on the wall panels was considered, but the need for free standing columns supporting extensions of the roof to form awnings, and the heavy cantilever roof loadings frequently encountered, indicated that a separate frame would be more flexible in application.

Roof Units

The roof units are of two types, cantilevered awnings, and infill. The cantilever type is materially the same as that used successfully in the Mark I system, and consists of a series of triangular section stressed skin plywood box beams. The roof rests on the top of the structural frame and cantilevers from it. The heavy loads on the beams are resolved by making the upper surface of the roof form the top chord of a deep truss, the lower chord of which is the normal aluminium beam. The infill unit rests within the depth of the aluminium beams and consists of simple hollow stressed skin punts constructed of timber and plywood. Either type of roof can be used on its own or the two types can be used in combination.

The external wall units have to be strong enough to brace the aluminium frame and at the same time be light enough to be easily handled. They must be faced externally with robust materials to stand up to the rough usage

normally experienced at railway stations. These requirements were met by designing the panels as stressed skin units, similar in principle to hollow flush doors, with internal timber spacing members.

Polyester Resin Sheet

The outer skin is of coloured reinforced polyester resin sheet. The reinforcement is glass fibre in combination with expanded metal where impact resistance is required and glass fibre alone where conditions are more normal. The inner skin can be of various types of building board to suit the requirements of the plan.

Internal partition units are similar in construction to the external wall units and are faced in various building boards. These units are not designed to brace the structure and are usually only one module wide.

An attempt has been made to allow the maximum diversity of panel or walling form within a structural framework which, although constant in detail and appearance, may vary in bay proportion. It is hoped that this inherent flexibility will avoid the monotony, sometimes euphemised as discipline, which is often found in pre-fabricated systems.

Such discipline as does occur is essential to the proper functioning of the parts and has the additional advantage of establishing a consistent vernacular for small stations.

The system was designed by Mr. W. R. Headley, Regional Architect, under the direction of Mr. A. N. Butland, Chief Civil Engineer, London Midland Region.

TRADING CONDITIONS IN CANADA.—In a supplement to the report, "Trading Conditions in Canada, 1958 and Prospects in 1959," issued in the special Register Service of the Board of Trade, London, it is stated that Canadian imports of machinery in the 10 months ended October were down by 20 per cent. For the whole year imports of machine tools from the United Kingdom declined by one-third, to £1,500,000, while imports of other industrial machinery rose by some 8 per cent to £23,700,000. In this field we would seem to be holding our own quite satisfactorily. The main sufferer has been the United States which supplies a very high percentage of these goods but import figures indicated that European countries also have increased their share of the market to some small extent. There are as yet no signs of recovery for machine tools, orders in recent months still showing a declining trend, but new orders for other industrial machinery have shown some improvement recently. There are a number of fields in which British machines were used extensively but there are many others in which we should be able to sell more. There is also a very real fear that, with the manufacturer located across the ocean, a prompt after sales service may not be available. The increase of our sales during a period of recession is an indication of the drive of many of our exporters in previous years.

Automatic Welding, Grinding, and Handling of Long Rails

Welding-cum-shear machine with unusual grinding and pusher units on wagons, used on Louisville & Nashville Railroad



Specially adapted wagon, marked NCG, for welding, grinder, and pusher machines. Testing for flaws is carried out in wagon on left

ALTHOUGH the welding of rails into long continuous lengths is now common practice on many railways, the methods by which it is achieved vary, at any rate in detail. One, based on a Swiss automatic welding machine, has lately been in use on the Louisville & Nashville Railroad in the U.S.A.

The actual welding was carried out under contract by the National Gas Cylinder Division of the Chemetron Corporation, using an electric automatic flash resistance type of welding machine designed and constructed under licence from the Swiss firm, H. A. Schlatter A.G.

The rails used are 132-lb., 39-ft. lengths without bolt-holes, and with no preliminary preparation except the removal of rust from their ends by grinder-polisher. From the storage racks they are handled entirely by machine; the only labour employed for the whole operation are two shifts each of eight men. Four are employees of the Chemetron Corporation responsible for the welding operations and the other four are railway staff.

Welding Process

Pressure on a button by the welding machine operator brings forward from the storage bed a second rail to butt against the first already held in the machine. The operator then lines up the ends of the two rails with a straight edge to precision limits before pressing a second button. This first causes the end of each rail to be heated electrically to a plastic consistency and, after an appropriate lapse of time, a pressure of 36 tons is applied to force the two rail-ends together. Finally, a 50-ton hammer-blow is struck automatically to force any foreign matter, gases and surplus molten metal from the joint. This blow also informs the operator

that the weld is complete; the timing of the whole operation is entirely automatic, and it takes only about 75 sec. from the pressing of the second button to completion. A third button is then pressed to operate a power shear, integral with the machine, to cut off surplus metal squeezed from the fusion of the two rail-ends.

The newly welded joint as part of a continuous string of rails then moves

forward into a grinding unit to remove mill-scale from around the weld. It is a belt-type grinder working automatically through a series of feelers, and is unusual on this account and in its use of abrasive belts instead of grinding wheels.

Beyond the grinder is a pusher machine also of uncommon design. It propels the string of welded rails through the machine on to flat wagons. It is worked by a motor driving two caterpillar-type endless treads one above the other. The treads are faced with aluminium to prevent their pressure from scoring the rail. This pusher develops a thrust of 25,000 lb.

The next move of the weld is on to a Magnaflux wagon, where two men check its alignment with a straight-edge and apply the Magnaflux test to detect any flaws that may occasionally occur.

Hand-grinders are used to remove any roughness remaining on the running surface before the weld moves forward again towards the rail wagons. A special ski-nosed shoe is bolted on to the front of the string of rails to facilitate its movement along the wagon floors. A man with a crowbar guides the string into its proper line of rollers between guiding plates on the wagons.

Rail-mounted Equipment

The welding unit, grinder, and pusher are all mounted in tandem on a 60-ft. all-steel wagon with fixed roof but hinged sides. Their lower halves let down to form walkways when stationary, the upper halves providing roofs over the operating area. The storage rack



Weld in process on machine behind the protective hood



Welded joint in machine, with shear cutting off surplus semi-molten metal

and other equipment for feeding rails to the welder are mounted on a separate flat wagon. A third wagon accommodates the Magnaflux and hand-grinding equipment.

Where commercial electric power is not available a fourth wagon carrying

a diesel-electric generator is added. High-voltage commercial power is converted by the welding transformer and frequency-changer into 10.6-cycle current of about 7V. and approximately 90,000 amp. When working at Mobile, Alabama, 95 welds were completed in each

8-hr. shift, but normally out on line 60 welds a shift is the average progress, or 120 in a two-shift working day.

Distribution on Line

To suit the lengths of the sidings available, the lengths of the strings of rails is limited to 1,326 ft. necessitating 34 welds in each. Between each 34-weld string and the next is interleaved a standard 39-ft. rail-length, secured by fishplates, to act as a buffer.

Two trains each of 30 flat wagons are used for carrying these long welded rails out for relaying. Each train carries 12 1,326-ft. rails; while one train is unloading on line the other is being loaded with more rails. One wagon in each rake is fitted with a winch to enable the unloading crew to pull the ends of the rails forward for threading on to the rollers on the wagons.

To prevent longitudinal movement of the rails on the wagons when in motion, the two end wagons in each rake are fitted with movable steel bulkheads and the rails are also clamped at the middle of each 30-wagon rake. Moreover, to eliminate slack between wagons steel-plate filler-blocks are used at the couplings.

Unloading is carried out in the usual way by drawing the wagons out from under each pair of welded rails at a time, the ends of the rails being anchored in the track or linked to their predecessors. When laid these rails are secured by three types of anchors, the drive-on type, those with compression clips, and the conventional force-on type; 22 anchors are used to secure each length of rail.

Continuous Cab Signal for Hump Shunting Engines

Application of continuous cab signalling to hump engines with rail current feed in rear and receiving coils mounted to suit

INCREASING use has been made during the last decade of wireless, inductive, and electronic devices for signalling, including the establishing of communication between moving trains and fixed points such as stations and signalboxes. In some cases, roadside apparatus also has been operated by such methods. In our issue of February 4, 1955, a description was given of an installation in the U.S.A. where level crossing barriers were caused to close by the sounding of the engine whistle at a location where the usual track circuit control was not satisfactory, because of the prevalence of shunting movements which would cause street traffic to become interrupted without real necessity. The sound of the whistle, received by a microphone at the crossing, creates a current which is amplified to operate a relay controlling the barriers and associated flashing warning lights.

Various methods of communication have been applied between control towers and hump engines in marshalling yards. Wireless has been used in the U.S.A. and on the Continent of Europe and tried experimentally in the United Kingdom where, however, reliance on three-aspect hump light signals, dis-

playing "stop," "hump slowly" and "hump at normal speed," is favoured. In recent years cab signals have been applied to hump engines in many yards in America.

Continuous Cab Signal

In continuous cab signalling, as used on main running lines, energy is fed to the rails at a point in advance of the train, to provide a warning and/or control conforming to the conditions ahead. This is not practicable with hump engines propelling vehicles in front which must necessarily short circuit the track.

The Chicago & North Western Railway has for many years had in operation on its 488-mile line between Chicago and Omaha a system of continuous cab signalling with automatic brake application and recently has adapted it to provide cab indications on three engines at its Proviso Yard near Chicago.

The receiving coils are in this case mounted behind the trailing wheels and pick up inductively a.c. energy fed to the rails about a mile in rear, far enough to cover the longest train likely to be moving towards the hump when, of course, nothing else may occupy the section in advance of the feed point. Normally, the

cab signal shows a red, or "stop," aspect.

The hump operator has a desk switch and can actuate this to close a contact and connect a 6 V. d.c. feed to a line circuit to energise a relay at the rail feed point. This in turn energises the rails at about 1 V. 60 cycles and the current created in the engine receiving coils is amplified to operate a two-phase relay, the contacts of which become changed to cut out the red and light the yellow cab signal indication, meaning "start humping" and "continue humping at normal speed." Only current flowing in the correct manner in the rails can produce this effect on the engine, where power is provided by an accumulator battery working through a motor generator.

Opening the switch at the operator's desk will de-energise the line and rail feed circuits and therefore the engine relay, restoring the "stop" aspect. A passing contact on this relay sounds a horn momentarily whenever the cab signal aspects change, to draw attention to the new order to the driver.

This arrangement was designed under the direction of Mr. L. E. Legg, Electrical Engineer for Equipment, in the C.N.W.R. Mechanical Department.

ELECTRIC RAILWAY TRACTION SECTION

Supervisory Control at Voice Frequencies

A COMPARISON between the apparatus used for remote supervisory control of power supplies in the first main-line electrifications of the former Southern Railway and that installed for post-war schemes of the Southern and Eastern Regions of British Railways reveals the trend towards telecommunication techniques. So far this has been most apparent in the way in which the adoption of telephone type relays and key switches has transformed the appearance of control rooms and mimic diagrams. A further step has now been taken by the use of coded voice-frequency currents instead of d.c. impulses for the remote operation and indication of switchgear on the Colchester-Clacton-Walton electrification. As mentioned in our April 17 issue, this is the first time voice frequencies (in the region of 1,000 cycles per sec.) have been used for such a purpose on British Railways, although they have naturally found extensive application for a number of years in the railways' own trunk telephone and teleprinter circuits. The Eastern Region installation, supplied by Standard Telephones & Cables Limited, uses fully-transistorised, rack-mounted equipment exactly as manufactured for telecommunications. The fundamental requirement is, of course, the same, namely that of transmitting several channels of intelligence simultaneously over one circuit also, with the spread of main-line electrification, it is necessary to provide for working over longer distances than are practicable with d.c.

A temporary control room is in operation at present at Colchester, but later the control will be transferred to Romford and will extend over all the 50-cycle electrified lines from Liverpool Street, namely the main line to Ipswich with its branches to Southend Victoria, Clacton and Walton, Harwich, and Felixstowe; and the Chingford, Enfield, Hertford East, and Bishop's Stortford lines. This will involve the control of 16 feeder stations and 26 track-sectioning cabins, with an additional site of each type when the main Cambridge line is electrified between Hackney Downs and Cheshunt. A second voice-frequency control at Pitsea will operate for the London, Tilbury & Southend section, covering three feeder stations and 11 track-sectioning cabins. It is likely also that additional sectioning facilities will be required on all these lines in the form of power-operated switches mounted on overhead structures, as have been provided in the Colchester-Clacton-Walton area.

An example of voice-frequency control already applied to a group of busy lines is seen at Douai on the Paris-Lille electrification of the French National Railway. This control, illustrated in our January 16 issue, has in its area six feeder stations and 37 track-sectioning cabins extending from Aveluy (near Longueau) to Lille; also, over the Arras-Valenciennes line, to Aouste (near Liart) on the Lille-Basle section, with the branches from Lens to Lapugnoy and Pont-à-Vendin. Control of feeder stations and track-sectioning between Longueau and Paris is exercised from the central control room at Paris Nord.

The area now served from Douai consists in effect of three independent systems sharing common power supplies at the control point. Each is linked with the control by a two-pair cable, in which one pair carries the control currents and the other the return indications. The return pair carries the same number of frequencies as there are stations connected to it, but on the control pair certain points of secondary importance share a common frequency and are selected individually by the coding of the currents. Up to eight may share a common frequency in this manner. To take an example, the cable serving the eastern portion of the area is connected to six principal and seven secondary switching stations. Its return pair carries all the 13 frequencies, but the outgoing pair carries only eight, namely one frequency for each of the six principal stations, a common frequency for the seven secondary stations, and a pilot frequency interrupted regularly to give 25-millisec. mark and 25-millisec. space periods. These are the basic code elements, and reception of this pilot signal at the 13 points controls their return signals so that these observe precisely the same mark and space periods. The pilot frequency is 1,260 cycles per sec. and it is keyed by a 20-cycle oscillator. A range

of frequencies is used for the control transmissions, an example being 960 cycles per sec. for the common control of the secondary switching stations.

In the Douai installation the frequencies are generated at present by thermionic valve oscillators, but the more recent control room at Paris Nord has been equipped with apparatus using transistors because it was found that of the faults occurring on the original scheme, the most frequent were those caused by ageing of the valves. The adoption from the outset of transistors in the British Railways installations will enable full advantage to be taken of current developments in these semi-conductor devices. Large-scale manufacture of silicon transistors is now being undertaken by one manufacturer and will shortly include audio-frequency power transistors, in which the improved temperature characteristics of silicon as compared with germanium are as important as they are in silicon rectifiers. It is probable, also, that the next few weeks will see the announcement of considerable price reductions for transistors of some types, and this may well herald a general trend which will benefit the electronic industry itself as well as users by encouraging the development of a further wide range of applications.

Multiple-Unit Stock for A.C. Electrification

THE rolling stock in service on the Colchester to Clacton and Walton branches, British Railways, Eastern Region is, of the same design as that to be used on the London, Tilbury & Southend Line of the same Region, when that line is electrified, and the electrification of the Clacton and Walton branches offers an excellent opportunity to test new sets coming from the works and destined ultimately for the London, Tilbury & Southend Line.

There are 112 four-car sets to be produced, the last of which is due to be finished early in 1960, and each will be tested in turn over the Colchester-Clacton-Walton electrified lines. This design will also be used for the rolling stock to be built for the electrified services over the Liverpool Street to Hertford East and Bishop's Stortford lines, except that the drivers' cabs will be of a modified streamline design. In external appearance the stock is similar to that already used on the existing Liverpool Street to Southend Victoria services via Shenfield. With a full complement of passengers a four-car set will weigh approximately 153 tons and the maximum speed will be 75 m.p.h. All the electrical equipment is being supplied by the English Electric Co. Ltd.

The normal unit consists of four coaches: a battery driving trailer, a motor coach, a non-driving trailer, and a driving trailer. The unit can be reduced to three coaches by omitting the non-driving trailer. Up to three units may be connected to operate in multiple unit.

Each motor coach is driven by four axle-mounted traction motors each rated at 272 h.p., 620V., 350A., 1 hr., and driving through single-reduction spur gearing. The motor coach is supplied with 50-cycle single-phase current at either 25kV. or 6.25 kV. through a single roof-mounted Stone-Faiveley pantograph and a Brown Boveri air-blast circuit breaker.

The supply is then taken to a supply changeover switch and on to the transformer primary winding. The secondary winding of the transformer supplies four excitron type air-cooled mercury-arc rectifiers which provide a d.c. supply for the traction motors. A tertiary winding provides a low-voltage supply for auxiliaries. The transformer and reactors are mounted under the underframe and are air-cooled. Various cases mounted under the underframes of the coaches accommodate control equipment and auxiliary apparatus and heating and lighting equipment.

The stock is being built at the British Railways works at York and Doncaster under the supervision of Mr. G. H. Taylor, Assistant Carriage & Wagon Engineer, Eastern and North Eastern Regions. At York, 112 motor coaches, 112 driving trailer coaches, and 76 trailer composite coaches are being constructed, and at Doncaster 112 battery driving trailer and 36 trailer composite coaches.

Traction Motor Repair Factory in Brazil

Reconditioning of components to original factory standards



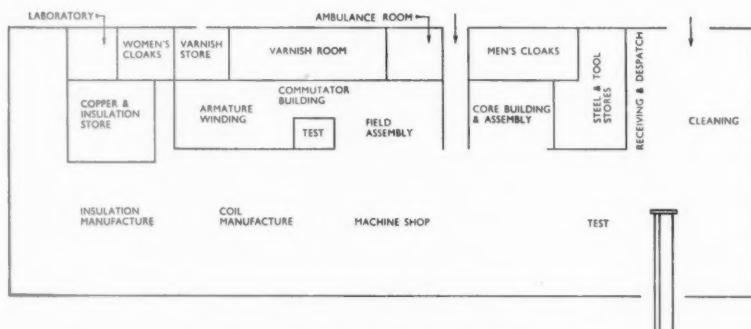
General view inside main works, showing field assembly section on left foreground and machine shop on right

THE first works in South America specifically designed and equipped for the repair of railway traction electric motors has been built by Metrovick do Brasil (Eletricidade) Ltda., a subsidiary of Metropolitan-Vickers Electrical Export Co. Ltd., on the outskirts of Belo Horizonte, Brazil. Its purpose is to provide maintenance service on more than

a railway rolling-stock works, foundries, and a steel works. The area is connected to the Central and Mineira Railways.

Major Overhauls

The plant was designed primarily for traction equipment which is not normally serviced in the railway workshops, and to renovate serviceable equipment



Plan of works, showing specialist sub-sections and mixed 5-ft. 3-in. and metre gauge rail track (bottom right)

200 motor coaches of the Central Railway of Brazil, 14 electric locomotives for the Mineira Railroad System, and 10 electric locomotives for the Paraná-Santa Catarina Railway. It is available for work on equipment of all makes and origins. The factory area in which the works is built, known as The Industrial City, is a State-sponsored development under which land is made available to industrial enterprises on a 99-year lease at a nominal fee. Other activities in the area include

which otherwise would be scrapped. This work includes complete overhaul and reconditioning of the electrical and mechanical components of driving motors, controllers, and auxiliary equipment such as compressor motors and exhaustor motors. Machinery is provided for the fabrication of coils and insulation. The inclusion of testing facilities makes it possible to execute work to the original factory standards and covered by equivalent guarantees.

The site covers a total area of about 170,000 sq. ft. of which the main bay of the shop floor occupies about 12,800 sq. ft. Offices at the front of the building are on a second floor at the elevation of the main road. A locomotive repair shed, with accommodation for up to three electric locomotives, has been erected in the grounds to enable more extensive work to be carried out, including the removal of defective parts and their re-installation after repair. Also this extension to the original works permits a general overhaul of all the electrical equipment on locomotives.

Machinery in the main shop includes a 10-ton overhead travelling crane, a Swift centre lathe supplied by Alfred Herbert Limited, a Cincinnati milling machine supplied by Kearney & Trecker Limited, and a horizontal borer by Forges Gilly Limited. Other equipment includes a baking oven supplied by Barlow Whitney, vacuum-pressure plant by General Engineering Co. Ltd., and various special items of plant designed and built by Metropolitan-Vickers Electrical Co. Ltd., at their Sheffield works.

At the corner of the site, placed with regard to future building development, is a sub-station which receives the overhead incoming supply at 13.2 kV. 3-phase, and feeds the factory at 220 V. through a 300 kVA. transformer. The sub-station also houses a 100 kVA. a.c. diesel-generator which keeps the essential factory operations going during interruptions of the outside supply.

Availability of Materials

Before the factory could attain a normal rhythm of production, much had to be done in the way of investigation and market research, to ensure that the materials employed, of local origin, were of equivalent standards to those available in Great Britain. As an example, mica used for insulation purposes and mined abundantly in Brazil is hard to obtain graded according to quality, thickness, and size, and conforming to the required standards. As a result the suppliers have to be convinced that it is worth their while to produce the required quality locally, instead of sending the raw material abroad to be processed and re-imported.

Labour Training and Organisation

Labour was another essential which had to be investigated very carefully, though experience has shown that the type of workman available at Belo Horizonte is of good basic quality and can be trained to proficiency. In preparation for technical work in fast-developing local industries, trainees from the age of 12 attend State schools for crafts and arts. Labour is not organised to the same extent as in Britain but conditions of work are strictly regulated by State labour laws.

(Continued on page 542)

Austrian Multiple Unit Express Electric Trains

15-kV., 16.6-cycle, single-phase multi-car sets for long-distance traffic, including Vienna-Zurich service via Arlberg



Two four-car "Trans-Alpin Express" sets coupled in multiple unit, Austrian Federal Railways

FOR a year now the Austrian Federal Railways, in conjunction with the Swiss Federal Railways, have been operating a greatly accelerated daily service between Vienna and Zurich, known as the "Trans-Alpin Express." For this purpose, the Austrian Federal Railways ordered from Simmering-Graz-Pauker A.G. four four-car multiple-unit electric train sets, Class "4130" in the Austrian Federal stock list, and each comprising one motor coach, two intermediate trailers, and one control trailer.

In practice, a four-car set is used only when traffic necessitates, and in the winter months a three-car formation of one motor coach, one intermediate trailer, and one control trailer, is often sufficient, though the train then is usually well filled, for it provides an excellent service from Vienna to Linz, Salzburg and Innsbruck, and also to Switzerland via the Arlberg line.

Passenger Accommodation

First-class and second-class accommodation is provided, and there is also a kitchen from which full meals and light refreshments are served to tables at the seats. First-class seats are in one of the trailers, and second-class seats in the motor coach and control trailer. In a three-car set there are 48 first-class seats, and 96 second-class seats grouped 62 in the motor coach and 34 in the control trailer. The last-named coach also houses the kitchen.

Seats are arranged two and one on each side of a central gangway, except in the end saloon of the motor coach. There, because of the location of the

force-ventilation duct for the traction motors immediately below the centre of the floor, the seats are arranged two and two. Luggage accommodation is provided in the motor coach and control trailer.

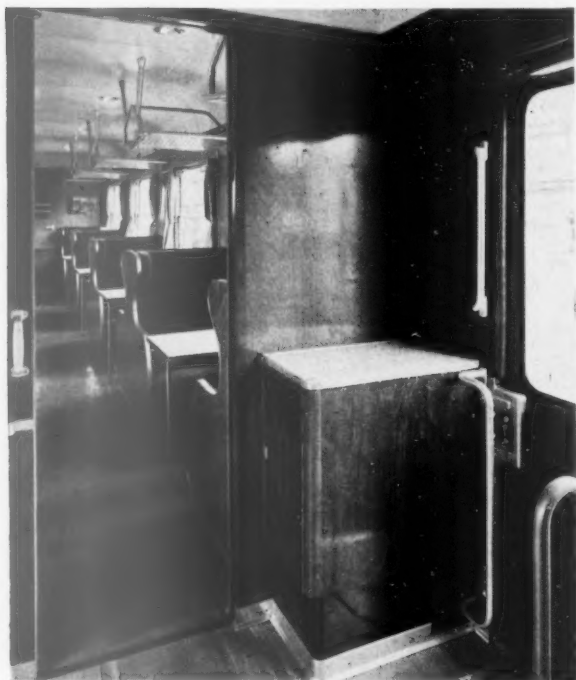
Ordinary 1,000-V. a.c. heaters are installed in the second-class saloons, but the first-class accommodation is heated by a hot air system. The upper section of each window can be opened by lower-

ing through the medium of a screw handle. Passenger communication between one coach and the next is through rubber bolster gangways.

Wheel dia. is 940 mm. (37 in.), and in the motor coaches the bogies are at a pitch of 16.25 m. (53 ft. 6 in.). Bogie wheelbase is 2.8 m. (9 ft. 3 in.), and length over buffers 23.19 m. (76 ft.). Overall length of the control trailer is the same, and of the intermediate trailer



Interior of second-class saloon



Entrance vestibule, with view through to second-class saloon



Motorman's compartment, showing arrangement of controls and instruments

22.99 m. (75 ft. 3 in.), so that a three-car set measures 69.37 m. (227 ft. 3 in.) overall. Top designed speed is 130 km.p.h. (81 m.p.h.). The weight of a motor coach is 69.8 tonnes (68½ tons), and weight of a three-car set about 140 tonnes. Standard air brakes are incorporated. The compressed air is furnished by an S.L.M. electrically-driven compressor.

Electrical equipment was supplied by the Austrian Siemens - Schuckertwerke. There is a spring-supported motor for each axle of the motor coach, driving the wheels through SSW ring-spring individual axle drive with rubber elements, and a gear ratio of 1 to 3.04.

Continuous wheel-rim output of the four self-ventilated motors is 1,090 kW. at 88 km.p.h. (54.8 m.p.h.) at 15 kV.

tension in the overhead line; and one-hr. aggregate rating is 1,220 kW. at 80 km.p.h. (50 m.p.h.). Respective wheel-rim tractive efforts are 4,550 kg. (10,000 lb.) and 5,600 kg. (12,325 lb.).

The oil-cooled transformer has a continuous capacity of 1,070 kVA. High-tension control with 25 notches is used. Train-heating load is 210 kW. as a maximum.

Traction Motor Repair Factory in Brazil

(concluded from page 540)

The report prepared by the Joint Brazil United States Economic Develop-

ment Commission, in 1953, stated in effect that it would be unnecessary for the Central Railway of Brazil to build additional workshops, as Metrovick do Brasil were installing such an establishment in Belo Horizonte. That the

factory should be regarded in this light is indicative of its importance to the country.



Fitting axle-suspension bearings after completion of traction motor overhaul

INSTITUTE OF TRANSPORT: FULL-TIME DAY COURSE IN LONDON FOR GRADUATE EXAMINATION.—The first school to provide evening classes for the Institute of Transport examinations was the former Haverstock Commercial Institute, London, N.W.3. It is therefore, interesting that the North Western Polytechnic, which later took over these classes, is the first organisation to offer full-time day courses. In the 1959-60 session, the North Western Polytechnic, Prince of Wales Road, London, N.W.5, of which Mr. R. W. Birch is Chairman of the Governors, will offer a full-time course for the Graduateship examination. In addition to examination studies, students will attend special classes designed to give them an insight into practical aspects of administration and for this purpose a variety of teaching techniques will be employed including case studies, role playing, syndicate work, tape recordings of group activities for analysis and discussion. Practical exercises will also be given in the arts of communication, effective speaking, report writing, chairmanship and interviewing. Throughout the course, emphasis will be laid on industrial visits and talks by executives in British industry.

RAILWAY NEWS SECTION

PERSONAL

Mr. W. Wessel Hansen has been appointed Chief Signal Engineer of the Danish State Railways.

Mr. K. J. Cook, O.B.E., M Mech.E.I., M.I.Loco.E., Chief Mechanical & Electrical Engineer, Eastern and North Eastern Regions, Doncaster, who, as recorded in our May 1 issue, is retiring on June 30, was educated at King Edward's School, Bath. Mr. Cook

Mr. J. H. Fraser, Chief Signal Engineering Officer, British Railways Central Staff, has been re-designated Chief Signal Engineer. Mr. E. A. Rogers, Assistant Signal Engineer (Modernisation), Eastern Region, has been appointed Assistant Signal Engineer (Modernisation), Chief Signal Engineer's Department, and Mr. D. S. Jewell, Divisional Signal Engineer, London Midland Region, Manchester, becomes Assistant Signal Engineer (General), Chief Signal Engineer's Department.

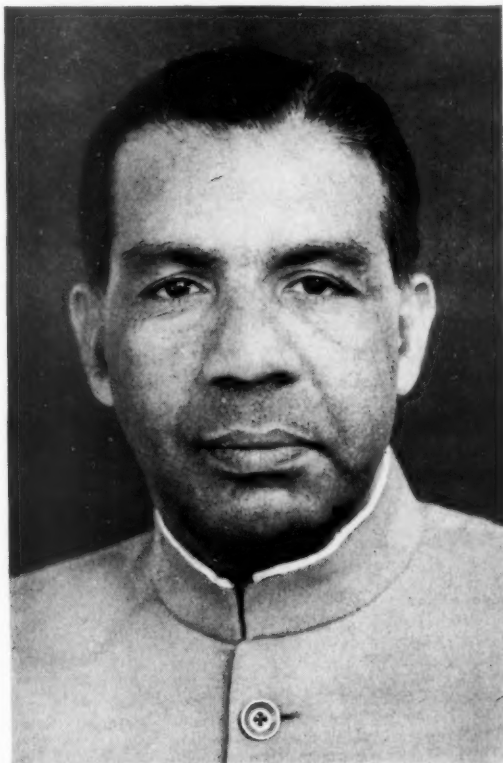
Engineer, London Midland & Scottish Railway in 1944, and was appointed to the position he now vacates in 1956. Mr. Langridge has served under 11 Chief Mechanical Engineers, during his 46 years on the railway.

Mr. M. M. Khan, Senior Deputy General Manager, Western Railway of India, who, as recorded in our May 1 issue, has been appointed General Manager, was born in 1908. Mr. Khan was one of the first Indian



Mr. K. J. Cook

Chief Mechanical & Electrical Engineer,
E. and N.E. Regions, 1951-59



Mr. M. M. Khan

Appointed General Manager,
North Western Railway of India

joined the Great Western Railway, in 1912, as a premium apprentice at Swindon Locomotive Works. After military service during the 1914-18 war, he entered the Chief Mechanical Engineer's drawing office and, in 1922, became Technical Inspector, Swindon Locomotive Works. He was appointed Locomotive Works Manager, Swindon, in 1937, and, in this capacity was responsible throughout the 1939-45 war for a large production of war stores for the fighting services. In 1947, Mr. Cook became Works Assistant to the Chief Mechanical Engineer, and, in 1948, Principal Assistant to the Chief Mechanical Engineer. In January, 1950, he was appointed Mechanical & Electrical Engineer, Western Region, British Railways. He took up his present position in July, 1951. Mr. Cook was awarded the O.B.E., in 1946, and was President of the Institute of Locomotive Engineers, 1955-56.

Mr. B. R. Temple, District Commercial Manager, Dundee, Scottish Region, British Railways, is retiring at the end of this month.

Mr. G. E. M. Fryer, Stationmaster, Portsmouth & Fratton, Southern Region, British Railways, retires at the end of this month after more than 51 years' railway service.

On conclusion of her recent tour of Oxfordshire, at Windsor Station, the Queen presented a signed picture of herself and Prince Philip, Duke of Edinburgh, to Mr. K. W. C. Grand, who recently relinquished the General Managership of British Railways, Western Region, on his appointment as Member of the British Transport Commission.

Mr. E. A. Langridge, M.I.Loco.E., Development Engineer, British Railways Central Staff, will retire on May 16. Mr. Langridge served his apprenticeship under the late Mr. Dougal Drummond, at Eastleigh, on the former London & South Western Railway. He joined the Midland Railway at Derby, as a draughtsman, in 1919, and was appointed Assistant Chief Locomotive Draughtsman in 1942. He became Development Assistant to the Chief Mechanical

officers recruited to the Mechanical Department of the Indian State Railways under the 1926 scheme. He began his railway service in 1927 and, after initial training in India, he received further training on the Southern Railway in England, from 1931 to 1933. He was appointed an assistant officer in the Mechanical Engineering and Transportation Departments, East Indian Railway, in 1933. He held an acting senior scale appointment in 1937, and subsequently became District Mechanical Engineer, Asansol Division; Works Manager, Locomotive Shops, Charbagh (Lucknow), and District Mechanical Engineer, Headquarters. In 1948 Mr. Khan became Deputy Chief Mechanical Engineer on the former East Indian Railway. In 1953 he was transferred to Lilloah as Deputy Chief Mechanical Engineer in charge of the Carriage & Wagon Workshop. In 1955 he was transferred to the North Eastern Railway and, in July the same year, he was promoted to be Chief Mechanical Engineer. Mr. Khan was appointed Senior Deputy General Manager, North Western Railway in June last year.



Mr. B. R. Temple

District Commercial Manager,
Dundee, Scottish Region, 1952-59

Mr. B. R. Temple, District Commercial Manager, Dundee, Scottish Region British Railways, who, as recorded in our April 24 issue, has retired, began his railway career in 1912 at Bedale, on the clerical staff of the former North Eastern Railway. He served with the King's Royal Rifle Corps for four years during the 1914-18 war and, on his return, became a clerk and relief clerk at various stations. In 1926 he went to the Goods Manager's Office, York, specialising in railway rates and, from 1935 to 1938, acted as District Canvasser at Hull. In 1939, Mr. Temple became Headquarters Inspector, York. In 1943 he was appointed Chief Clerk, District Goods & Passenger Manager's Office, Peterborough and, in 1944, he was appointed Assistant District Goods & Passenger Manager, Peterborough. He went to Glasgow, in 1946, as Head of the Development Section, Goods Manager's Office, L.N.E.R. and, in 1949, became Head of the Freight Revenue Section, Scottish Region. In 1950 he was appointed Development Assistant to the Commercial Superintendent and, in 1952, he was made District Commercial Manager, Dundee.

We regret to record the death on April 28, at the age of 84, of Sir William James Larke, K.B.E., D.Sc., M.I.E.E., M.I.Mech.E., Director, British Iron & Steel Federation, from 1922 to 1946. He was a former member of the Disposal Board, Ministry of Munitions; Director-General of Raw Materials, 1919-22; and controller, Non-Ferrous Mineral Development, 1942-45. Sir William Larke was President of the British Standards Institution, 1949 and 1950, and of the Institute of Fuel 1933-37. He was awarded the Bessimer Gold Medal of the Iron & Steel Institute in 1947.

B.T.C. APPOINTMENTS

The British Transport Commission announces the following appointments:

Finance Department

Mr. G. A. Hughes, Assistant, General Manager's Office, Euston, London Midland Region, to be Traffic Costing Officer, B.T.C. Headquarters.

Mr. C. R. Stuart, Assistant Traffic Costing Officer, Birmingham, to be Acting Traffic Costing Officer, Birmingham.

Services of the Commission

Mr. G. F. Woodward, Senior Assistant Architect, to be Sectional Architect.



Mr. J. R. Barker

Commercial Manager, New Zealand Government
Railways, 1953-59

Mr. J. R. Barker, Commercial Manager, New Zealand Government Railways, who, as recorded in our March 27 issue, has retired, began his railway career as a clerical cadet at Wellington. He served at various North Island city and country stations, and, in 1936, entered the District Traffic Manager's Office at Auckland. Mr. Barker was engaged in tariff duties from 1939 to 1944, when he was appointed Commercial Agent, Auckland. He gained commercial experience in the Auckland District, and, in 1953, was appointed Commercial Manager. Mr. Barker is a keen sportsman; for the past 6 years he has been chairman of the New Zealand Railways Rugby Football Council.

Mr. A. A. Morris has been appointed Sales Manager, Northey Rotary Compressors Limited.

Mr. A. A. Eko, Assistant Establishment Manager, Nigerian Railway Corporation, and Mr. T. O. Songonuga, Welfare Officer, are visiting Britain, under the auspices of the International Welfare Society, to study industrial relations, personnel administration and welfare matters. They will visit industrial concerns, trades unions, employers' associations, and social service organisations.

Mr. P. E. Garbutt, M.B.E., has been appointed to a newly-created position of Superintendent (New Works) Railway Operating Department, London Transport Executive, with the rank of Principal Executive Assistant. Mr. Garbutt, who is 39, served the London Midland & Scottish Railway from 1934 to 1939. He joined the Army in 1940, and was commissioned in 1941. He served with the Royal Engineers in North-West Europe, and later became British Secretary, Allied Transport Directorate, Germany. He attained the rank of Lt.-Colonel and was awarded the M.B.E. in 1946. He joined London Passenger Transport Board in 1947. After serving in the Press Office, and the Commercial Department, he was appointed Planning Assistant (Railways) in 1952. Mr. Garbutt visited Vienna, at the request of the Austrian Control Commission, in 1949. He attended the Administrative Staff College, Henley, in 1952. In 1955, he visited underground railway systems in North America. He is a graduate of the Institute of Transport and a Fellow of the Institute of Linguists.



Mr. F. G. Culling

Appointed Commercial Manager, New Zealand
Government Railways

Mr. F. G. Culling, Assistant Commercial Manager, New Zealand Government Railways, who, as recorded in our March 27 issue, has been appointed Commercial Manager, joined the railway, in 1921, as a cadet at Christchurch. He subsequently served at various South Island offices and stations, chiefly in Otago and Southland. In 1941, after two years as stationmaster at Kingston, he was transferred to the Traffic Manager's Office at Invercargill, where he was concerned with the commercial activities. In 1944 he was appointed Commercial Agent at Invercargill, and later at Dunedin. Early last year was appointed Assistant Commercial Manager, Wellington, the appointment he now vacates. Mr. Culling was a member of the New Zealand Railways team which won the Australian and New Zealand Railways Bowling Carnival at Wellington in 1958. He is currently Treasurer to the New Zealand Railways Bowling Association.

Mr. L. Rotherham has been co-opted to the Council of the British Welding Research Association.

Mr. A. G. Gilbertson has been appointed Managing Director of the Brown Lenox Group, and Chairman of Brown Lenox & Co. (London) Limited.

Mr. H. Walker has been appointed Assistant Manager, Staff Recruitment & Training, Personnel Department, Metropolitan-Vickers Electrical Co. Ltd.

Mr. Cyril W. Warwick has been appointed Freight Market Representative, Ministry of Transport & Civil Aviation, in succession to Sir John Gibson Graham, who has retired owing to ill-health.

Mr. W. E. Prior, Northern Rubber Co. Ltd., has been re-elected Chairman and Mr. J. W. Mann, Joseph Lucas (Electrical) Limited, Vice-Chairman of British Mechanical Rubber Manufacturers' Association.

Mr. J. L. Perry, Assistant to District Engineer, London (Eastern) District, Southern Region, British Railways, and Mr. J. A. Walton, Senior Engineering Assistant, London (Eastern) District, have been elected Associate Members of the Institution of Civil Engineers.

NEW EQUIPMENT AND PROCESSES

High-voltage Indicator

A HIGH-VOLTAGE indicator has been developed so that measurement of voltages on railway 25 kV. a.c. overhead lines can be carried out quickly, efficiently and safely. The indicator can distinguish between d.c. static, ordinary a.c. and induced voltages. Of the electrostatic type, it has two ranges, 0 to 15 kV. and 0 to 30 kV., the accuracy being approximately plus or minus 5 per cent of full scale.

To facilitate reading from below, the scale is clearly marked, and the angle of the voltmeter can be varied. The testing head can be hooked over the conductor, and an insulated disc on the rod prevents over-shooting.

The top section of the testing rod, carrying the steel hook, is made of thick high-grade bakelised paper and the remaining two sections are of glass fibre. Each section is 4 ft. long. The equipment can be easily dismantled and packed in a lightweight carrying case.

The indicator has been designed by Ferranti Limited, Hollinwood, Manchester, at the request of British Railways. Further details may be obtained from the manufacturer.

Earth-Moving Equipment

THE Model "B" Tournapull is a 360 h.p. tractor of completely new design, incorporating an entirely new transmission.

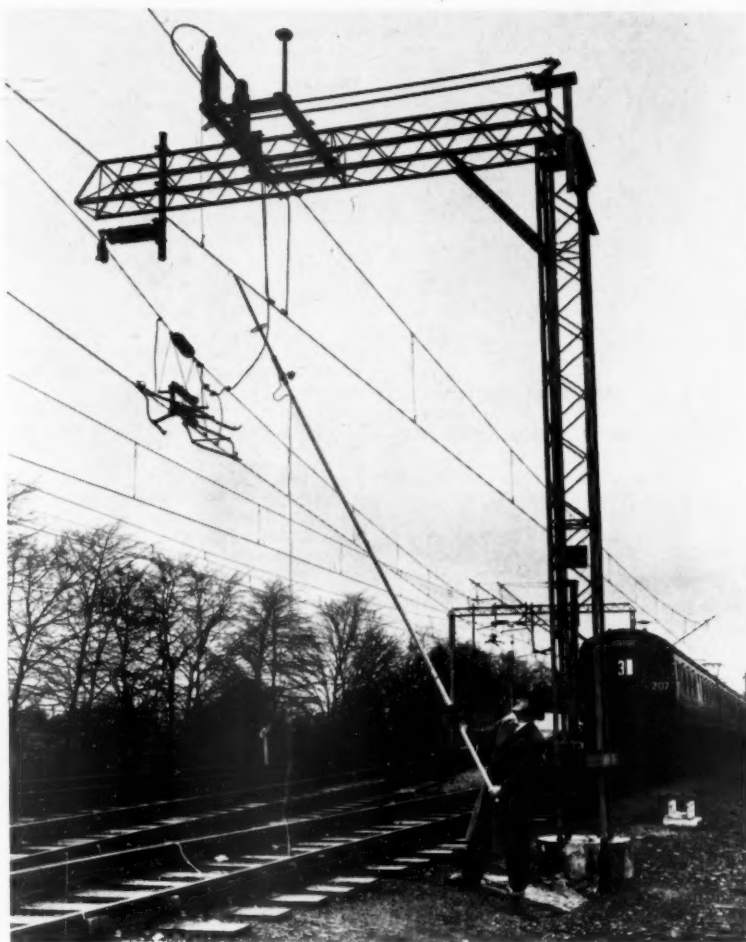
The engine is a G.M. turbo-charged six-cylinder two-cycle diesel, available in combination with Allison torque-converter transmission or the new step-gear transmission. It is claimed that certain characteristics of the compression and exhaust give improved power output.

Improvement also is claimed in respect of speed-selection with the Allison transmission, while smooth and easy shifting is a feature of the leverless auxiliary gear-box incorporated in the step-gear transmission. With this, as the gear-box is air-actuated, only one lever is used to shift the main transmission.

Struck capacity is 21 cu. yd., 28 cu. yd. heaped. A quick-drop mechanism on the bowl lift saves time in handling "difficult" materials by enabling the operator to "pump in" the load.

The scraper is interchangeable with other trailing units designed by the manufacturer for use behind the prime mover. A 35-ton rear dump and 30-ton crane also are available in the "B" size units.

Further details can be obtained from the manufacturer, the LeTourneau-Westinghouse Company, Peoria, Illinois, U.S.A.



Spherical Bearings

THE Glacier Spherical Journal Bearing is a self-contained, self-aligning bearing assembly for general engineering use. The bearing surface is spherical and this enables a single bearing surface to carry both journal and thrust loads.

It consists of two sub-assemblies. One is the sphere, which is in halves with a hole to suit the shaft size for which the bearing is intended. This sphere is clamped to the shaft and rotates with it. The other is the bearing housing. This incorporates a lubricant

sump and has a flanged base for mounting. The housing is also split, for assembly.

Typical applications for fan shafts, transmission shafts, and motor shafts. The accuracy and surface finish of the shaft are not critical. The spherical bearing surface allows the bearing assembly to tolerate substantial misalignment.

It is claimed that the bearing requires no attention in service, other than topping up with oil at long intervals. A sight glass is provided for this purpose. Spherical Journal Bearings will be available in standard (shaft) sizes from $\frac{1}{4}$ in. dia. upwards.

Further details may be obtained from the manufacturer: the Glacier Metal Co. Ltd., Alperston, Wembley, Middlesex.

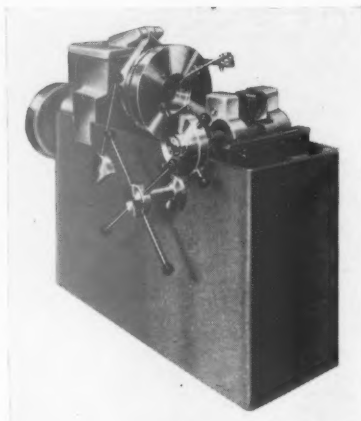
Protective Clothing

HYDEX waterproof industrial protective clothing is suitable for use by railway shunters and men working on the track.

The fabric is claimed to be tougher and lighter in weight than conventional coated rayon or cotton fabric. By using a low twist yarn, it is stated that the tear strength of the resultant coated fabric is appreciably increased.

The price of standard garments, is approximately twice that of similar items in P.V.C.-





coated rayon or cotton, but it is claimed that the life is many times greater.

Further details may be obtained from the manufacturer, Jelteck Limited, Green Lane, Hounslow, Middlesex.

Threading Machine

A RE-DESIGNED 2 in. pipe 2 in. bolt capacity threading machine, Maiden 2c/ST, for general purpose and maintenance work, has been produced.

The machine incorporates the following new features.

Totally enclosed, automatically lubricated headstock, with shafts on replaceable bearings; forged steel replaceable head for increased strength and wear resistance; robust, narrow guided saddle, with long bearing surfaces carried under the die head; hammer action vice to eliminate operator fatigue, and large star traverse wheel for ease of thread start with inverted rack to prevent damage from swarf.

The machine has a tapering mechanism of simple design, also lever release, close to the die head, which avoids stopping the machine after completion of a thread.

The cabinet combines a swarf tray, with provision for easy removal of cuttings; the coolant equipment is so designed that splash from the rotating die head is controlled.

The cost of the machine, inclusive of coolant equipment and all electrical apparatus, is £303.

Further details can be obtained from the manufacturers, Landis Machine-Maiden Limited, Hyde, Cheshire.

Welding Rods

ADDITIONS have been made to the Sifbronze range of welding rods:—

Process 101 is claimed to be a new method of welding cast-iron, producing high quality joints. Sluggish flow across the joint face is said to be eliminated and a greater degree of penetration into the parent metal avoids peeling. The resultant weld is stronger than the original cast-iron.

Process 104 is a rod of the same alloy, but coated with a new flux for continuous welding. The flux itself, it is claimed, has a strong scavenging action on cast and malleable iron.

All grades of cast-iron can be welded by standard oxy-acetylene equipment, using either type of rod. Pre-heating may be dispensed with in certain cases.

The illustration shows a close view of an actual fracture which is well clear of the weld.

Further details may be obtained from the manufacturer: Suffolk Foundry (1920) Limited, Stowmarket, Suffolk.

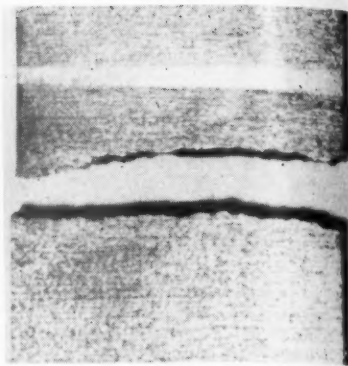
New Air Compressor

A DEVELOPMENT of the oil-cooled rotary Power Vane compressors of the Consolidated Pneumatic Tool Co. Ltd., is the Class R range, for stationary electric operation.

The compressor consists of a simple vane-type rotor, eccentric with the casing, enclosed in a sealed compression casing. Sliding vanes inserted radially in longitudinal slots in the rotor, create sealed sectors of varying capacity.

Air is taken into the casing when the gap between rotor and casing wall is increasing. As the sector rotates towards the discharge ports, its volume is decreased, this continues until full compression is reached.

It is claimed that the rotary principle results in smooth operation and pulsation-free air delivery. Water cooling of the oil is



optional as an alternative to air cooling.

The range consists of units with capacities of 100, 135, 160, 300 and 510 cu. ft. per min. at a pressure of 100-lb. per sq. in.

Further details may be obtained from the manufacturer: Consolidated Pneumatic Tool Co. Ltd.

Cutting Machine

THE S.I.F.-Combi Profile cutting machine, has been introduced to the British market. It can be used either as a magnetic profile cutting machine, whereby continuous production can be carried out by means of a steel template, or as a straight line and circle cutter.

The cutting motor head is detachable from the frame for use as a separate unit. The machine is of 12 Volt d.c. type. Direct current is generated by a rectifier or transformer and the machine can be connected to any lighting plug (a.c. or d.c.), or to a 12 Volt battery, without using the rectifier or transformer.

To meet the numerous different cutting speeds a 5-stage switch is incorporated. Maximum lengths of approximately 5 ft. and a diameter of approximately 2 ft. 3 in. can be covered. Larger diameters can be obtained by using auxiliary circle-cutting aids.

The S.I.F.-Combi Profile Cutter will accommodate most types of manual cutting blowpipe, clamped to a vibration-free swivelling arm. The cutting template need only be $\frac{1}{8}$ in. thick and it may be adjusted with longitudinal and transverse directions.

Further details may be obtained from the Suffolk Iron Foundry (1920) Limited, Sifbronze Works, Stowmarket, Suffolk.

Testing Electrical Insulation

AN improved method for testing insulating materials used in diesel-electric locomotives, has been devised.

Visual warning of imminent breakdown of insulation under test is given on an oscilloscope screen, in a specially designed test instrument. It is claimed that insulation may be subjected to direct-current test voltages, without destroying the insulation during the test. The oscilloscope gives information about electrical changes in the insulation as it approaches the point of breakdown.

Insulation damage is preceded and accompanied by the shifting of electrical charges in the material, and the instrument, designed to detect these shifts, will give warning of impending breakdown.

The instrument has been developed by the Locomotive & Car Equipment Department, General Electric Company, U.S.A., 2901, East Lake Road, Erie, Pennsylvania, U.S.A., from which company further details may be obtained.



Royal Albert Bridge Centenary Celebrations at Saltash

I. K. Brunel's engineering genius recalled

On Friday, May 1, members of the British Transport Commission and of the Western Region of British Railways joined with the civic representatives of Plymouth and of many Cornish local authorities to celebrate the centenary of the opening of the Royal Albert Bridge, which was designed by Isambard Kingdom Brunel. The proceedings commenced with a reception at the Guildhall, Saltash, by the Mayor, Alderman W. T. H. Stanlake, who, after a service of thanksgiving in Saltash Parish Church, unveiled a plaque to Brunel in Saltash Station forecourt. The plaque, with a brass study of Brunel set in marble, with the bridge as a background, commemorated the "Centenary of the Royal Albert Bridge, designed and built by Isambard Kingdom Brunel, engineer of the Great Western Railway, the Cornwall Railway and associated broadgauge companies." The two bottom corners of the plaque show the crests of the old Cornwall Railway and of the Great Western Railway Company.

The Mayor of Saltash, the Lord Lieutenant of Cornwall (Lt.-Colonel Sir Edward Bolitho) and the Lord Bishop of Truro (the Rev. E. R. Morgan) were the speakers at a luncheon in the Guildhall after the unveiling ceremony.

During the afternoon, Sir John Carew Pole, Member of the Western Area Board of the British Transport Commission and Chairman of the Cornwall County Council, opened the Royal Albert Bridge Centenary Exhibition of paintings, models, and numerous relics of Brunel at the Plymouth Museum & Art Gallery. This had been arranged by the Curator, Mr. A. A. Cumming, and Mr. B. Y. Williams of British Railways. Mr. L. F. Wills of the Western Region, Chief Civil Engineer's Department, had also contributed to the display.

Replacement Not Contemplated

At a dinner given by the Lord Mayor of Plymouth, Alderman G. J. Wingett, at the Grand Hotel, Alderman H. G. Mason proposed the toast of "I. K. Brunel, coupled with the Western Region of British Railways." He said that although the bridge had been standing for one hundred years, it showed no signs of requiring renewal, and, indeed, when plans for the new Tamar road bridge were being discussed, the railways had been asked if they would contribute to a joint rail-road structure. The answer had been that British Railways did not intend replacing the Royal Albert Bridge in the foreseeable future. Alderman Mason thought that the bridge might well last another hundred years.

Mr. R. F. Hanks, Chairman of the Western Area Board, British Transport Commission, who replied to the toast, referred to the criticism sometimes made that the pride of the G.W.R. had gone with the disappearance of its name on the nationalisation of the railways. He said that the Western Region was a very proud region and that the spirit of Brunel still lived in it. He referred to a number of present and recent railway officers and said that Mr. K. W. C. Grand, formerly General Manager, who had only lately become a Member of the Commission, was a railwayman of great experience and ability and independence of thought and action.

Spirit Still Preserved

Mr. J. R. Hammond, the present General Manager, was an engineer well-versed in the traditions of the Western. He had particularly asked Mr. Hanks to say that the celebrations had been prepared by his

predecessor, Mr. Grand. They were all delighted to have Sir Allan Quartermaine, lately Chief Civil Engineer of the G.W.R., with them at the celebrations, and in Mr. Mark Smith, the present Chief Civil Engineer, the spirit of Brunel continued. The Western Region accepted the challenge of the present and the future and would live up to the traditions it had inherited. It was the spirit and not the name that counted, and he was convinced that the old Great Western spirit was as fully alive at the present time as it ever had been.

After the dinner the party moved back to Saltash, where Mr. Grand introduced Mr. F. Edworthy, Bridge Examiner, who per-

formed the official switching-on of the flood-lights on the bridge.

Among the Members of the British Transport Commission, and of British Railways, and the principal guests who attended the celebrations were:—

Mr. G. H. Anthony, Mr. H. G. Bowles, Colonel Sir John Carew Pole, Mr. Arthur Chamberlain, Mr. N. S. Cox, Mr. A. A. Cumming, Mr. F. G. Dean, Mr. L. C. Edwards, Mr. F. Edworthy, Mr. E. Flaxman, Mr. K. W. C. Grand, Mr. T. R. Hall, Mr. J. R. Hammond, Mr. R. F. Hanks, Mr. P. T. Heady, Mr. L. J. L. Lean, Mr. W. A. Nightingale, Mr. A. C. B. Pickford, Mr. C. W. Powell, Sir Allan Quartermaine, Mr. C. J. Rider, Mr. C. Robinson, Mr. C. W. Rodd, Mr. C. T. Rogers, Mr. J. Ryan, Mr. R. A. Smeddle, Mr. M. G. R. Smith, Mr. E. W. C. Thomas, Mr. A. H. Curtis Welch, Mr. B. Y. Williams, and Mr. A. W. Woodbridge.

Improved Services on British Railways

Sir Brian Robertson on achievements and plans in the Birmingham area

The Chairman of the British Transport Commission, Sir Brian Robertson, speaking in Birmingham at the annual banquet of the Birmingham Chamber of Commerce on May 1, mentioned various plans to improve British Railways services in the Birmingham area, including electrification of inter-urban services, the high-speed diesel Pullman expresses to run between Paddington and Birmingham and Wolverhampton, and the rebuilding of Birmingham New Street Station, London Midland Region.

On the standard of British Railways passenger and goods services, he referred to unpunctuality. The driver, he stated, was usually one of the least to blame for late running. Serviceability of the locomotive and rolling stock, quality of coal, the judgment of the signalman, alertness of station staff, condition of the permanent way, and even the co-operation of the passengers, all played their part. In addition there was the weather, and the past winter had been a phenomenally bad one from the railway point of view.

Reliability of "Condor" Service

On the reliability of goods services, he stressed that the export express service had a proved record of reliability. Today most trains conveying general merchandise were equipped with continuous brakes, and so could run at high speed. As a result, overnight delivery was being given regularly on many services, such as the "Condor" container service between London and Glasgow, with afternoon collection in London and delivery next morning in Glasgow or vice versa. The service had never been late yet. In the difficult years after the war the railways acquired a reputation for unreliability of service. That reputation tended to dog them still, despite improvements. The railways, he went on, deserved some encouragement. They were not asking for favours. Their services must stand on their merits for quality and price. On the other hand, they should be spared prejudice.

Successful Diesel Train Services

As to the quality of service, they must judge for themselves. Around Birmingham, for example, a wide extension of diesel passenger services had achieved good results.

Passengers using the diesel suburban services operated by the London Midland Region in the Birmingham area increased by over 31,000 in January, compared with the same month last year. On the Birmingham-Lichfield line, journeys had increased

from 32,000 monthly (when there were steam trains) to more than 95,000. Patronage of the longer-distance inter-city diesel trains to and from South Wales had been well maintained.

High-Speed Diesel Expresses

Referring to future developments, he mentioned the Pullman diesel trains being built by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., at Salford, near Birmingham, to run at high speeds between Paddington and Bristol and Paddington and Birmingham and Wolverhampton.

Electrification Plans

Besides electrification at 50 cycles a.c. of the main line of the London Midland Region between Euston, Manchester, and Liverpool, Sir Brian Robertson stated that it was intended to convert certain inter-urban lines in the Birmingham area at the same time. In conjunction with these plans it was intended to rebuild Birmingham New Street Station, L.M.R., harmonising the scheme with the plans of the City Council for the re-development of the central area of the city.

Much was being done in the Birmingham area to modernise and simplify the marshalling yards and goods depots. Important work at Lawley Street Goods Depot, for example, would be completed by the end of this year.

Competitive Railway Charges

The railways, he continued, today were quoting very competitive charges. He took it as confirmation of this that some of their competitors recently had complained to the Government that British Railways had been cutting their charges. They were not losing money by doing so. Sir Brian Robertson added that he preferred the attitude of the Road Haulage Association when it stated, as it did in its manifesto, that the railways and the road hauliers would benefit themselves and their customers by co-operating to produce the best possible service, while continuing to be competitive in price.

The railways, he pointed out, were going through a crisis; their financial situation was sufficient evidence of that. They were in mid-stream of modernisation. They also were engaged "on a slimming process, which was not a symptom of decay but something necessary for their future health and prosperity." They would emerge from the crisis with added strength. There were signs of that already.

In this situation a realistic attitude on the

part of all concerned with the railways was needed. Management must be realistic in adapting the services in extent, quality, and price to the needs of the present and the future, and must not imagine that the good old days could be conjured back by applying the good old ways. The men in the industry must be realistic, and understand that their future prosperity depended on that of the industry and not imagine that some fairy godmother would produce some other answer.

Trade and industry also must be realistic. He "recalled with pleasure" that the Association of British Chambers of Commerce had told him recently that it regarded retention of an efficient and economic railway service in Britain as essential to the prosperity of the country and of their members. If this was so, then realism demanded that the railways should be judged fairly on the basis of their true merits and not of past prejudices.

Passenger Fares

The travelling public must also be realistic about the question of fares, which had gone up much less than most other prices. The railways could not be expected both to pay their way and to peg their fares at un-economic levels.

Inauguration of New Telephone Exchange at York

A new 800/1,200 line private automatic branch telephone exchange, the first in the United Kingdom to embody private "on demand" subscriber trunk dialling providing for omnibus working with automatic code signalling, was inaugurated in British Railways, North Eastern Region, headquarters offices at York last Tuesday, when the installation was formally handed over to Mr. T. H. Summerson, Chairman of the North Eastern Area Board, British Transport Commission, by Mr. C. O. Boyse, Managing Director, Automatic Telephone & Electric Co. Ltd.

The first call to be made through the new exchange was to Sir Brian Robertson, Chairman of the British Transport Commission who was in Brussels attending the annual general meeting of the board of the Cie Internationale des Wagons-Lits. He received the call in the office of Monsieur M. de Vos, General Manager of the Belgian National Railways, and the messages received from both Sir Brian Robertson and Monsieur de Vos were relayed by loud-speaker to those present at the ceremony.

Later, Mr. H. A. Short, General Manager of the North Eastern Region of British Railways inaugurated the subscriber trunk dialling service by making a direct "on demand" call, without any intermediate operator assistance, to Mr. W. Clegg, District Goods Superintendent, Leeds.

With the inauguration of the exchange, British Railways at York has pioneered the first private subscriber trunk dialling network. Operating initially in the North Eastern Region, it will ultimately include "on demand" trunk dialling to Kings Cross, Edinburgh, Manchester, and other important railway centres. The exchange includes seven manual positions, and is equipped for omnibus working with automatic code signalling. Direct dialling is by voice frequency signalling circuits over audio and carrier links.

The exchange switching and associated v.f. equipment has been manufactured by the Automatic Telephone & Electric Co. Ltd., and supplied through Communications Systems Limited, sales distributor for private telephone equipment and a member of the A.T.E. group.

The new exchange replaces a 310 line

exchange which has been in service for 25 years. It is at the end of its useful life and for some time has been incapable of handling the volume of work required in the railway headquarters.

Re-organisation of B.R.S. Parcels Service in London

Alteration by British Road Services in the organisation of its London parcels service is intended to cut transit times by reducing the amount of transhipment. The principle adopted is the segregation of consignments collected in the London Area between (a) consignments for re-delivery in the London area; and (b) consignments for delivery in the provinces.

Customers in London are being asked to segregate traffic consigned to the London area from that destined for other areas, as one van will call for London and another for provincial traffic. London traffic will go to a depot specialising in London Area deliveries and provincial traffic will go to another depot for direct transfer to vehicles travelling to provincial destinations. By this means it is expected that considerable time will be saved.

The depot at Macclesfield Road, E.C.1, will be the central depot for traffic collected for re-delivery in the London Area, with assistance from depots on the outskirts of London as necessary.

Three main depots in London will be used for collection and delivery of consignments to and from the provinces. One of these will be at Willow Walk, Bermondsey, S.E.1, to cover collections and deliveries for the provinces in the London Area south of the Thames.

New depots are proposed for the North East and North West sectors of London, but during the interim period traffic for these sectors will be covered: (a) for N.E. London, by Waterden Road, Stratford, which has been extended for the purpose; and (b) for N.W. London, by Coppetts Road, Muswell Hill, with assistance from Acton depot until the new depot is built.

Consignments from the provinces for

delivery in London will be pre-sorted at the forwarding depot to the appropriate London delivery depot, which will deliver direct to consignee.

Staff and Labour Matters

N.U.R. Wage Claim

At a meeting of the Railway Staff Joint Council on May 6, at which representatives of the B.T.C. and of the three railway trade unions were present, the General Secretary of the N.U.R., Mr. S. F. Greene, submitted the claim on behalf of his union for a substantial increase in the rates of pay of railway salaried and conciliation staff.

The Commission representatives undertook to consider the matter in the light of the arguments advanced and to give a considered reply as soon as possible.

Redundancy of Railway Workshops Staff

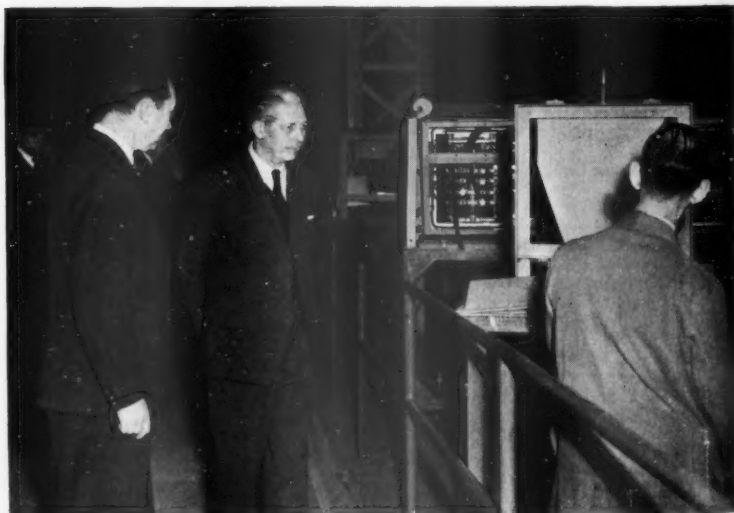
At a further meeting of the Railway Shopmen's National Council on April 30, agreement was reached on redundancy and transfer arrangements for railway workshop staff.

The agreement lays down a procedure for determining and dealing with workshop staff redundancy, and includes arrangements under which redundant staff, who remain in railway employment in a lower-rated post, may retain their standard time work rate of pay for up to three years.

It also incorporates a scheme for payments to railway shopmen with over three years' service whom, after the operation of the agreed redundancy arrangements, it is necessary to discharge from the service.

The payments take the form of an initial lump sum, payable on discharge of two thirds of standard time work rate of pay less unemployment benefit in respect of a period ranging from two to 13 weeks according to the number of completed years' service. If a man is still unemployed at the expiration of the period covered by the lump sum, he will be eligible for further payments at the same rate, but paid on a weekly basis, terminating at the end of a similar number of weeks or when he finds other employment, whichever is the sooner.

The Prime Minister at English Electric Co., Ltd.



Mr. Harold Macmillan, the Prime Minister, with Mr. H. G. Nelson, Managing Director, English Electric Co. Ltd., inspecting a.c. equipment for multiple-unit trains for the L.T.S. line of the Eastern Region at the company's Preston works

Questions in Parliament

Victoria Tube Representations

Mr. E. C. Redhead (Walthamstow W.—Lab.), asked the Minister of Transport & Civil Aviation on April 29 what was the date of the most recent representation he had received from the London Transport Executive concerning the urgent need for work to be started on the construction of the proposed Victoria Line; and what reply he had made thereto.

Mr. Harold Watkinson in a written answer: The Chairman of the B.T.C. last wrote to me about the proposed Victoria line on April 2. I have replied that I fully appreciate the arguments in favour of the line, and that I shall endeavour to reach a decision when I receive the report of the London Travel Committee.

DUNLOPILLO CHANGE OF ADDRESS.—Headquarters of the Dunlopillo division of the Dunlop Rubber Co. Ltd., has moved from Walton, Liverpool, to Rochdale. The new address is: Castleton, Rochdale, Lancashire, telephone Rochdale 47444.

GENERAL ELECTRIC CO. LTD. AT BRITISH TRADE FAIR, LISBON.—Among products of the General Electric Co. Ltd. to be exhibited by the Engineering Company of Portugal Limited at the British Trade Fair, Lisbon, on May 29-June 14, will be a traction motor and master controller similar to those in service on the Estoril Electric Railway. The motor has a maximum rating of 140 h.p. continuously, or 170 h.p. for one hour, four machines being mounted in a motor coach. With this equipment, the driver pre-selects the combination required, notching-up following automatically under the control of a current limit relay. Also there will be a multi-anode rectifier rated at 1,200 kW., 1,600V. of the pumpless air-cooled steel tank type now in service with the Estoril and Metropolitan Railways of Portugal. A 'Com-Pak' equipment will represent recent developments in mercury arc rectifiers as supplied to British Railways for the 25-kW. a.c. electrification scheme.

WESTERN REGION FIRST-AID MOVEMENT.—The teams which gained the first nine places in the British Railways, Western Region, first-aid semi-finals competed in the final competition held in the Porchester Hall, Paddington, on April 28 1959. The tests were set by Dr. D. D. Towle, of London, Dr. A. G. Walker, of Wolverhampton, and Dr. C. T. Newnham, Regional Medical Officer. Many spectators, including Officers of the Region, witnessed the contest. The subsequent presentation of prizes and trophies was presided over by Mr. S. G. Ward, Regional Establishment & Staff Officer and the presentations were made to the winning team by Mr. Horace F. Parshall, Director-General, St. John Ambulance Association. The result of the test was announced by the Regional Ambulance Secretary, Mr. J. A. Martin. Out of a maximum of 500 marks, Bristol D.O.S.O., winners of the Challenge Shield, gained 405½, and Banbury "A," winners of the Carvell Cup, gained 385. The Henry Butt Bowl was presented to the Barry Docks team, who secured the highest position in the beginners' section in this year's competitions. A vote of thanks to the adjudicators, patients, and other helpers was proposed by Mr. J. R. Hammond, General Manager, and to Mr. Parshall, Mr. Hammond, and Mr. Ward by Mr. S. Stevens, captain of the London District Engineers' team. The Bristol D.O.S.O. and Banbury "A" teams will represent the Region in the British Railways, Docks, and London Transport (Railways) National Competition, which is being held in the Central Hall, Westminster, on June 5.

Contracts and Tenders

Rolling stock for Rhodesia Railways

Rhodesia Railways has placed the following contracts:—

Gloucester Railway Carriage & Wagon Co. Ltd.: 9 63-ft. 5-in. coaching stock underframes complete with bogies.

Dundalk Engineering Works: 16 35-ft. coaching stock underframes complete with bogies.

The Lebanon State Railways has placed an order with Henschel-Werke G.m.b.H., Kassel, Western Germany, for three diesel locomotives and 150 wagons.

British Railways, London Midland Region, has placed the following contracts:—

G. A. Poole Limited: accommodation for carriage and wagon and operating staffs at Hem Heath Colliery Sidings, Trentham

Ernest Webster & Co. Ltd.: cleaning and painting of Manchester Victoria Passenger Station

Ruberoid Co. Ltd.: waterproofing well deck units of bridge at River Esk Viaduct, and waterproofing deck units of bridge at Runcorn Viaduct

West's Piling & Construction Co. Ltd.: piling and foundations at Cricklewood lightweight and main line diesel depot

Butterley Co. Ltd.: reconstruction of superstructure of bridges on Leicester and Trent Line, and between Betley Road and Crewe

Octavius Atkinson & Son, Ltd.: crane gantries at Crewe Electric Locomotive Repair Shop.

British Railways, Eastern Region, has placed the following contracts:—

W. & C. French Limited: Construction of new signal box at Harlow Mill

Alex. Findlay & Co. Limited: Supply and delivery of steelwork for reconstruction of superstructure of underline bridge No. 43 over Coborn Road, between Bethnal Green and Stratford

Hosking & Son (Essex) Limited: Construction of signal box with relay room, telephone exchange, workshop and mess-room accommodation at Broxbourne

Higgs & Hill Limited: Construction of a shed for maintenance of diesel locomotives and ancillary works at Stratford Motive Power Depot.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Korea:

Railcars, generators, electric motors, manual controllers, oscillating fans, and permanent way equipment.

The issuing authority and address to which bids should be sent is the Office of Supply, Government of the Republic of Korea, Seoul, Korea. This purchase will be financed by the International Co-operation Administration (I.C.A.), the agency through which the United States Government gives economic and technical assistance to other countries. The tender No. is 461-M-2. The closing date is May 14, 1959. The Board of Trade reference is ESB/10229/59/ICA.

From Pakistan:

40 ejectors, S.J. combination type "G" R.H. outside fixing complete with standard steel flanges, release valve, and with blank flange for steam brake valve

6 hydrostatic lubricators with separate condenser, four feed, five pint capacity, A. C. Wakefield or equal for all classes. The issuing authority is the North Western

Railway. The tender No. is 210-S/62-1(PIL). Bids should be sent to the Chief Controller of Stores, North Western Railway, Lahore. The Closing date is May 19, 1959. Local representation is essential. The Board of Trade reference is ESB/10132/59.

11 items of tough pitch or deoxidized copper firebox tube plates, firebox wrapper plates, back plates and patching plates, steel flanged firebox back plates, and steel boiler patching plates.

The issuing authority and address to which bids should be sent is the Chief Controller of Stores, North Western Railway, Empress Road, Lahore. The tender No. is 210-S/O-BR(PIL)59. The closing date is May 16, 1959. Local representation is essential. The Board of Trade reference is ESB/10133/59.

Further details regarding the above tender, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

The Special Register Information Service, Export Services Branch, Board of Trade, reports that the closing date of the call for tenders from India for roller bearing axleboxes and wheel sets, recorded in our issue of April 3, 1959, has been postponed to May 15, 1959.

The Special Register Information Service, Export Services Branch, Board of Trade, states that the closing date for the receipt of bids against the call for tenders from Thailand for 10 metre-gauge diesel railcar sets recorded in our issue of June 13, 1958, and for which a revised specification was recorded in our issue of March 20, 1958, is now postponed to June 4, 1959.

Notes and News

Tube Investments Limited.—The interim ordinary dividend of Tube Investments Limited again is to be 7½ per cent, payable on June 1.

Re-opening of Rheidol Valley Railway.—The 1-ft. 11½-in. gauge Rheidol Valley line of British Railways, Western Region, will be re-opened on May 16, for the 1959 season. Running between Aberystwyth and Devils Bridge, the line passes through 12 miles of picturesque scenery. During the summer of 1958, over 27,000 passengers travelled by it.

East Anglian Ranger Ticket.—Six days of unlimited rail travel anywhere in East Anglia, from stations on the Great Eastern Line of British Railways, Eastern Region, within a wide radius of London, are available to holders of East Anglian Ranger Tickets to be issued until October 30. The tickets, second class only, cost £3 and are valid from Sunday morning till Friday evening. They are not valid on Saturdays.

N.E. Region Excursions and All-in Tours.—Special day-outing excursion trains by British Railways, North Eastern Region for women's organisations are reported again to be proving very popular. Already this year bookings for the 78 outings arranged have exceeded those of previous years. Excursions normally are run on mid-week days during summer, to distant places of interest such as Hereford (for Wye Valley), Portsmouth, and Ardrossan (for Arran). In most cases coach tours and/or steamer trips are included. From May to September inclusive holiday-period tours by rail, coach and/or steamer again have been organised by the Creative

Tourist Agents' Conference in conjunction with British Railways. The tours cover Scotland, the Isle of Man, and Southern Ireland.

C. A. Parsons & Co. Ltd.—The group trading profit for 1958 of C. A. Parsons & Co. Ltd., declined from £3,785,712 to £3,128,025. The year's dividend is repeated at 7½ per cent, in addition to which there is a special dividend of ½ per cent.

Specially Overprinted Tickets for Travel over Saltash Bridge.—During the commemoration of the centenary of the Royal Albert Bridge, Saltash, cheap day return tickets to Saltash,



Day return ticket to Saltash specially overprinted during Royal Albert Bridge centenary celebrations

involving travel over the bridge have been overprinted as shown in the accompanying illustration, to enable them to be retained as souvenirs.

Western Region Train Derailed at Slough.—The "Pembroke Coast Express" from Cardiff to Paddington, British Railways, Western Region, was derailed at Slough on May 1. Six people were injured and one man was detained in hospital, but his condition was not serious. As the train approached Slough Station it broke in half and the last six coaches left the rails. Five of the coaches stayed upright, but the guards van in the centre turned on its side. The first four coaches and the locomotive carried on through Slough Station, and the last coach

of this section, the restaurant car, also left the track. The cause of the derailment has not yet been established.

London Transport Travel Inquiry Service in City.—The London Transport Executive has opened a travel inquiry service in the City of London Information Centre in St. Paul's Churchyard, opposite the Cathedral. It is being provided experimentally during the summer months to help visitors. A travel inquiry clerk will be on duty every weekday at a special counter in the centre, to give information about London Transport bus, Green Line, and Underground services, to issue travel maps, and to sell "Rover" bus and rail tickets.

Adjustable Driver's Seats Demonstrated.—For the recent European Productivity Agency Conference at Zurich, A. W. Chapman Limited loaned a number of adjustable driver's seats and photographs which formed the basis of the United Kingdom exhibit. These examples of fitting the man to his work were televised throughout Europe. At a conference of the Ergonomics Research Society held at Balliol College, Oxford, the same exhibits were loaned to the Department of Human Anatomy. They included several types of seats for drivers of locomotives, cranes, and road vehicles, and a special demonstration outfit showing the advantages of the new "Level-Ride" suspension. A. W. Chapman Limited has since been asked to lend the equipment to other conferences later this year.

British Standard for Insulating Oil.—A revised British Standard publication, B.S. 148: 1959, insulating oil for transformers and switchgear applies to unused oil as delivered in tank wagons or drums, suitable for the immersion or filling of transformers, switchgear, and certain other electrical equipment in which oil is required as an insulant or for heat transfer. It does not apply to high viscosity oils, to oils required for cables or capacitors, or to oils for special impregnation purposes. Minor technical changes in the present revision are deletion of the

evaporative loss test, and the improvement of the procedures for acidity determination by the substitution of alcoholic alkali for aqueous alkali. Copies price 8s. 6d., may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

Unexploded Bomb at Hither Green.—A German unexploded bomb, dug up last week, 49 yd. from the British Railways, Southern Region up main line at Hither Green, was made harmless by disposal experts. During work on the bomb a screen of 18 wagons was positioned between it and the main line.

Western Region Road Safety Trophy.—Mr. J. R. Hammond, General Manager, British Railways, Western Region, at Paddington, on April 29, presented the Safety on the Roads Trophy to Mr. F. G. Dean, District Traffic Superintendent, Plymouth, Western Region, on behalf of the District. The trophy was donated by the Company of Veteran Motorists. The award is made annually to the District with the best record of freedom from blameworthy accidents.

British Oil Equipment Credits Limited.—A subsidiary company of the Council of British Manufacturers of Petroleum Equipment, has been registered with the name British Oil Equipment Credits Limited. It has been formed to promote schemes for the sale on deferred terms to overseas purchasers of capital plant and equipment made in the United Kingdom for the petroleum industry. The Chairman is Mr. E. F. E. Howard of Hayward Tyler & Co. Ltd. and the Managing Director is Mr. G. V. Sims, Director of the Council. The address is that of the Council at 2, Princes Row, Buckingham Palace Road, London, S.W.1.

British Standard for Rubber Safety Boots.—The new British Standard publication B.S. 1870: Part 2: 1959, rubber safety boots, deals with footwear of the laced rubber ankle pattern and the knee length pattern. Each may be made in either of two forms of construction: compounded rubber latex or calendered sheet rubber compound. It specifies minimum qualities for the materials used, together with construction details and the necessary tests and test requirements. Among the searching tests is one for protection against blows on the toe, and a leakage test is designed to ensure the entire boot is waterproof. The rubber components are tested for their tensile strength and elongation, both before and after artificial ageing. The uppers are submitted to 80,000 or more continuous flexes as part of a series of tests on batch samples. Copies, price 4s., may be obtained from the British Standards Institution, 2, Park Street, London, W.1.

New United Steel Film.—The press premiere of the latest film produced by the United Steel Companies Limited, "Steel Town," took place at the Royal Commonwealth Society, Northumberland Avenue, London, on May 4. The film will be shown to United Steel shareholders at 11 a.m. each day on Wednesday and Thursday, May 27 and 28, 1959, at the Odeon Cinema, Leicester Square, London. Invitations already have been sent and additional tickets may be obtained from the Public Relations Department of United Steel at Westbourne Road, Sheffield, 10. "Steel Town" shows the close links between the town of Stocksbridge and Samuel Fox and Co., Ltd. Sequences show the making of special and alloy steels from arrival of raw materials to despatch of finished product. Shots are given of apprentice training facilities, joint consultation in action, and social and sporting activities. The film was produced in Eastman Color by

Royal Albert Bridge Centenary



Poster from a painting by Terence Cuneo, produced by the Public Relations & Publicity Department of British Railways, Western Region, to commemorate the centenary of the Royal Albert Bridge, Saltash (see pages 526 and 547)

Wallace Productions Limited. Written and directed by Mr. Bill Mason, it was produced by Mr. Frank Bundy. Mr. Wolfgang Suschitzky was responsible for photography. Running time is 25 min.

Clayton Dewandre Co. Ltd.—Mr. A. V. Perry, the Chairman of Clayton Dewandre Co. Ltd., states that the earnings for 1958 covered the dividend 1.76 times as against 2.46 the previous year, and that this change is wholly occasioned by reduced turnover owing to lack of demand. £60,000 is to be placed in reserve.

Western Region Publicity.—Produced by the Public Relations & Publicity Department of British Railways, Western Region, the two posters shown in the accompanying illustration are intended for display throughout British Railways during 1959-61. That depicting Plymouth is by Laurence Bagley, and it is printed in six colours by Jordison & Co. Ltd. The Harlech Castle poster is by Ronald Lampitt. This is printed in nine colours by the British Colour Printing Co., Ltd.

The Hoffmann Manufacturing Co. Ltd.—The profit of the Hoffmann Group for 1958 before taxation, but after all other charges, including debenture interest, amounts to £1,206,476 and compares with £1,291,746 for the previous year. The final ordinary dividend is 24½ per cent making a total of 31 per cent less tax. Also there will be a special 60th anniversary cash bonus of 5 per cent. Mr. J. W. Garton, the Chairman and Managing Director, reports that large automatic machines newly installed have helped to reduce costs and, as a result, orders have been secured in very competitive circumstances. Production by Hoffmann Gloucester Limited of axleboxes for railways is steadily increasing.

British Transport Films' Success at Harrogate Festival.—British Transport Films, the films service of the British Transport Commission, won six of the 25 awards at the recent Festival of Films in the Service of Industry, at Harrogate. The six awards and the films which secured them are as follow, shown in the classes in which the films are grouped: **Public Relations—General Audiences:** Premier Award, "The Travel Game," Honourable Mention, "Under Night Streets";



Plymouth
MODERN CITY BY THE SEA
Guide (P.B. 84) from Publicity Manager (Dept. B.R.)
TRAVEL BY TRAIN



HARLECH CASTLE
Open to the public all the year round. Weekdays at 1.30 p.m.
Sundays 2 p.m. Admission: Adults 1s. Children under 14 years 6d.
BY TRAIN TO HARLECH STATION
which is in close proximity to the Castle

Two products of the Public Relations & Publicity Department of British Railways, Western Region

Human Relations & Welfare: Premier Award, "Care of St. Christophers"; **Health & Safety:** Honourable Mention, "It's a Dangerous World"; **Productivity & Efficiency:** Honourable Mention, "Work Study and Tom Howard"; and **Special Award by the British Association for the Advancement of Science:** "Between the Tides." Viscount Monckton presented the awards to Mr. Edgar Anstey, Films Officer, B.T.C.

G. W. R. Special Trainees' Twenty-eighth Annual Reunion.—The twenty-eighth reunion of the Great Western Railway special trainees took place on April 24 at the Great Western Royal Hotel, Paddington. The arrangements this year were in the hands of the trainees selected in 1937. The chair was taken by Mr. D. W. M. Wilson, Road Motor Engineer, British Railways, Western

Region. The function was a very successful one and was attended by 39 members of the old training scheme. The toast of "British Railways" was proposed by Mr. D. Layton, of the National Coal Board Headquarters, and responded to by Mr. G. R. Bonavia, Sales Assistant to the Traffic Manager, Eastern Region, Cambridge. The toast of "Colleagues Overseas" was proposed by Mr. E. Havers, and responded to by Mr. D. Bartlett, General Manager, Malayan Railway, who will shortly be leaving this post to take up an important position in South Wales, and also by Mr. H. J. Shailes, home on leave from his position as Chairman of the Penang Port Commission, Malaya.

Vickers Limited Results.—The directors of Vickers Limited have recommended a final ordinary dividend of 7½ per cent for the year ended December 31, 1958. This with the interim already paid makes a total for the year of 10 per cent. The group profit after allowing for taxation of £6,058,377 (£6,995,742) was £6,592,257 (£6,202,629).

Coventry Machine Tool Works Limited.—Group profits for 1958 of Coventry Machine Tool Works Limited have expanded from £63,713 to £75,322. The dividend is 17½ per cent (unchanged) and for 1959 there is a special interim of 8½ per cent which will not be taken into account when considering further dividends. In addition there is to be a one-for-two free scrip issue.

British Railways Amateur Boxing Championships.—The challenge shield, awarded annually to the Region whose contestants obtain the most points in the British Railways Amateur Boxing Championships, was won jointly by the Southern and Western Regions as the result of the inter-Regional semi-finals and finals at the Albert Hall, London, on April 30. The two winning Regions tied with 26 points. The London Midland Region obtained 24 points, the North Eastern, 10, and the Eastern and Scottish Regions, 7 points each. The previous holder of the shield was the London Midland Region. The awards were presented by Sir Brian Robertson, Chairman



Mr. Edgar Anstey, Films Officer, B.T.C. (left), receiving from Viscount Monckton the awards gained by British Transport Films productions at the Harrogate Festival

of the British Transport Commission and President of the British Railways Amateur Boxing Association. The challenge shield was handed over to Mr. C. P. Hopkins and Mr. J. R. Hammond, General Managers respectively, of the Southern and Western Regions. Others present included Sir John Benstead, Deputy Chairman, and Mr. K. W. C. Grand, Lord J. Rusholme, Mr. T. H. Summerson, and Sir Reginald Wilson, Members of the B.T.C.; and Messrs. David Blee, H. C. Johnson, James Ness, and H. A. Short, General Managers respectively of the London Midland, Eastern, Scottish, and North Eastern Regions.

Canadian National Railways Bond Issue.—Mr. Donald Gordon, Chairman & President of Canadian National Railways, has announced a new issue of \$150,000,000 of 5 per cent bonds to be dated May 15, 1959. The bonds will be offered immediately through investment dealers and banks. Proceeds will be used to repay temporary interest-bearing capital advances from the Canadian Government.

General Electric Co. Ltd. at Transistor Exhibition.—A display of transistor applications by the General Electric Co. Ltd., at the International Transistor Exhibition to be held at Earls Court, London, on May 21-27 will include transistor inverter units designed to supply a.c. power for fluorescent tubes from a d.c. source. One variation is that supplied to British Railways, operating on the normal 24-V. d.c. supply from the coach batteries, and converted to provide the required operating voltage at a high frequency. A special working display will demonstrate the functioning of a transistorised level-measuring gauge by means of a fully visible liquid supply at varying levels. In the field of telecommunications, there will be several examples of transistor applications to units employed in multi-channel, open-wire, and co-axial cable systems.

B.T.C. Clyde Steamer Services.—Mr. Alexander Stewart, General Manager, the Caledonian Steam Packet Co. Ltd., last week met representatives of the Clyde Coast resorts in regard to the services to be given next winter. These are on similar lines to last winter and there was full agreement on the proposals. Two new British Transport films, "Coasts of Clyde," and "Scotland for Sport," were shown to the Clyde Provosts and Town Clerks. The films stress the attraction of Scotland for tourists and holidaymakers. The total number of passengers carried in 1958 was 4,219,605, a slight decrease compared with the previous year. This decrease was due to the poor weather up to the middle of August. Last season there were 121 charters to private organisations. The number of tenders to transatlantic liners was 61. During the winter structural alterations were made in the three car ferry vessels, m.v. *Arran*, *Cowal*, and *Bute* to increase the motor-car carrying capacity. The cargo hold was plated over, and each vessel can now carry eight additional motor-cars, 34 as compared with 26. This should help considerably in avoiding delays during the Summer season.

Jessop-Saville Film.—The premiere of a 25-min. film "Cutanit Cemented Carbides," produced by Jessop-Saville (Small Tools) Limited, took place in London on May 5. The film, which is in Kodachrome, shows the manufacture of tipped cutting tools from cemented carbides by co-operation between Metro-Cutanit Limited and the Jessop-Saville organisation. Beginning with the fine tungsten oxide powder, the manufacturing processes are followed through to the finished hard metal sintered tips. It is possible to learn from the film something of the care needed in achieving consistently

high quality in their production. Apart from tool tips, additional uses shown for Cutanit include press tools and a particularly abrasive application in the manufacture of refractory bricks. Examples are shown of the correct use of tools fitted with Cutanit sintered tips to make possible greater machining outputs with reduced costs. Firms wishing to be included in the distribution of copies which are on 16-mm. film, should apply to the Publicity Manager, Jessop-Saville (Small Tools) Limited, Brightside Works, Sheffield 1.

Forthcoming Meetings

May 9 (Sat.).—Permanent Way Institution, Leeds & Bradford Section. Visit to long welded rail plant at Dinsdale.

May 9 (Sat.).—Permanent Way Institution, London Section. Visit to Britannia Tubular Bridge, Menai Straits, London Midland Region, British Railways. Joint visit with North Wales Section.

May 16 (Sat.).—Railway Correspondence & Travel Society, Sussex & Kent Branch, at the Railway Hotel, Brighton, at 6.30 p.m. Paper on "Dougald Drummond, the man and his work," by Mr. T. Clyde Britten.

Railway Stock Market

Industrial shares again reached new high levels and featured in exceptionally active stock markets, where satisfaction with company results, and higher dividend hopes, have been the main talking points. British Funds have been firmer, though the prevailing view is that an early reduction in the Bank Rate seems unlikely. The general election is not expected until the autumn, but the City is becoming more confident of prospects of a Conservative victory.

Movements among foreign rails were mostly small. Costa Rica ordinary stock strengthened from 13 to 13½ and the 6½ per cent first mortgage debentures changed hands and were quoted at 75½. Brazil Railway bonds were quoted at 5½. Guayaquil & Quito assented bonds were 80½, while elsewhere, International of Central America common shares were 82½ and the preferred stock 81½.

In other directions, San Paulo Railway 3s. units have been marked down from 1s. 10½d. to 1s. 6d. United of Havana second income stock was again 6 with the consolidated stock at 1½. Chilean Northern first debentures were 55½.

Antofagasta ordinary stock held the recent improvement to 13½, while the preference stock moved up from 25½ to 26; the perpetual debentures kept at 36 and the 5 per cent (Bolivia) debentures at 85½. Mexican Central "A" bearer debentures kept at 59.

Nyasaland Railways shares were again 13s. 9d. with the 3½ per cent debentures 59½d. Midland of Western Australia income debentures were quoted at 12½ and Emu Bay 5 per cent irredeemable debentures at 25. Algoma Central & Hudson's Bay common stock was 7½.

Canadian Pacific remained at 853½ with the 4 per cent debentures better at 66 and the 4 per cent preference stock fractionally lower at 54. White Pass shares were 813½. In other directions, West of India Portuguese capital stock was again quoted at 105½d with the 5 per cent debentures 91½. Calgary & Edmonton and New Brunswick Railway 4 per cent consolidated debentures have each changed hands at 63.

Among shares of locomotive builders, engineers, and kindred companies, business

has been rather more in evidence, and gains, though moderate, predominated. Beyer Peacock, 5s. shares strengthened from 7s. 7½d. a week ago, to 8s. and moreover, Charles Roberts 5s. shares moved up from 11s. 7½d. to 12s. their best this year. Westinghouse Brake held steady at 43s. 9d. because of hopes of higher dividend prospects, but in other directions, G. D. Peters were marked down from 26s. 3d. to 25s. though the shares remained firmly held and the lower quotation did not appear to be tested by business. Birmingham Wagon shares at 20s. 4½d. more than held their recent rise, and North British Locomotive improved from 9s. 3d. to 9s. 9d. On the other hand, Gloucester Wagon 10s. shares receded from 17s. 10½d. to 17s. 6d., but Wagon Repairs 5s. shares have risen on balance from 8s. 9d. to 9s. 6d. Buyers were in evidence for Pollard Bearing 4s. shares, which have risen from 26s. 6d. a week ago to 30s. 3d. Ransomes & Marles 5s. shares were firm at 18s. while a strong feature has been an advance of almost 5s. in Davy & United Engineering shares to 104s. Acrow Engineering 5s. shares rose to 48s. 9d. on the view that the directors' share plan opens up the prospect of a further increase in dividend. Ruston & Hornsby were good at 28s. 7½d., Tube Investments rose to 85s. but Stone-Platt Industries at 51s. 10½d., lost a small part of their recent sharp advance. T. W. Ward strengthened to 89s.

B.I. Cables advanced afresh from 54s. to 56s. 3d. Associated Electrical at 60s. 3d. lost a few pence of last week's advance, English Electric strengthened to 64s., General Electric were firm at 32s. 3d., and Crompton Parkinson 5s. shares have been well maintained at 14s. 4½d.

OFFICIAL NOTICES

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